northern telecom

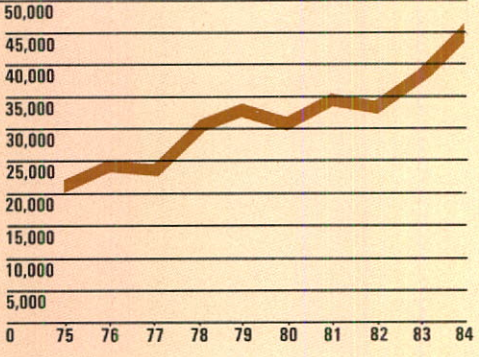
Annual report to employees 1984

NORTHERN TELECOM: At Work Worldwide

Shown below are the countries throughout the world in which Northern Telecom employees are working to bring the vision of the Intelligent Universe into reality.

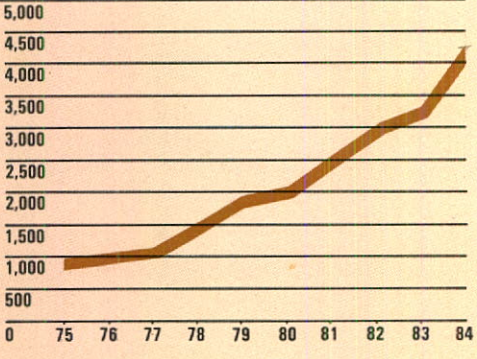
Number of employees

at December 31



Total revenues

(millions of dollars)



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All dollar figures are in Canadian currency unless otherwise indicated.

Northern Telecom's *Annual Report to Employees* is designed to provide employees with information about the corporation's activities and objectives worldwide. Like the corporation's annual report to shareholders, it presents a financial and operational overview of the corporate issues that may directly affect them.

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OF MANAGEMENT
MAY 29 1985

EDUCATION: A STRATEGIC INVESTMENT

The acquisition of knowledge from any academic or scientific discipline develops the qualities we need to succeed as individuals and as a corporation.

In today's information-rich and highly complex society, the modern corporation has assumed many responsibilities that go far beyond its traditional role of earning profits on behalf of its shareholders. Among its other roles, the progressive corporation has become an educational institution, providing a myriad of courses and programs to develop the skills and knowledge of its employees.

Northern Telecom is no exception. In 1984, this corporation spent nearly $40 million on employee education and training. Although much of this funding was directed towards specific job functions, a significant portion was also devoted to external programs for the educational development of employees.

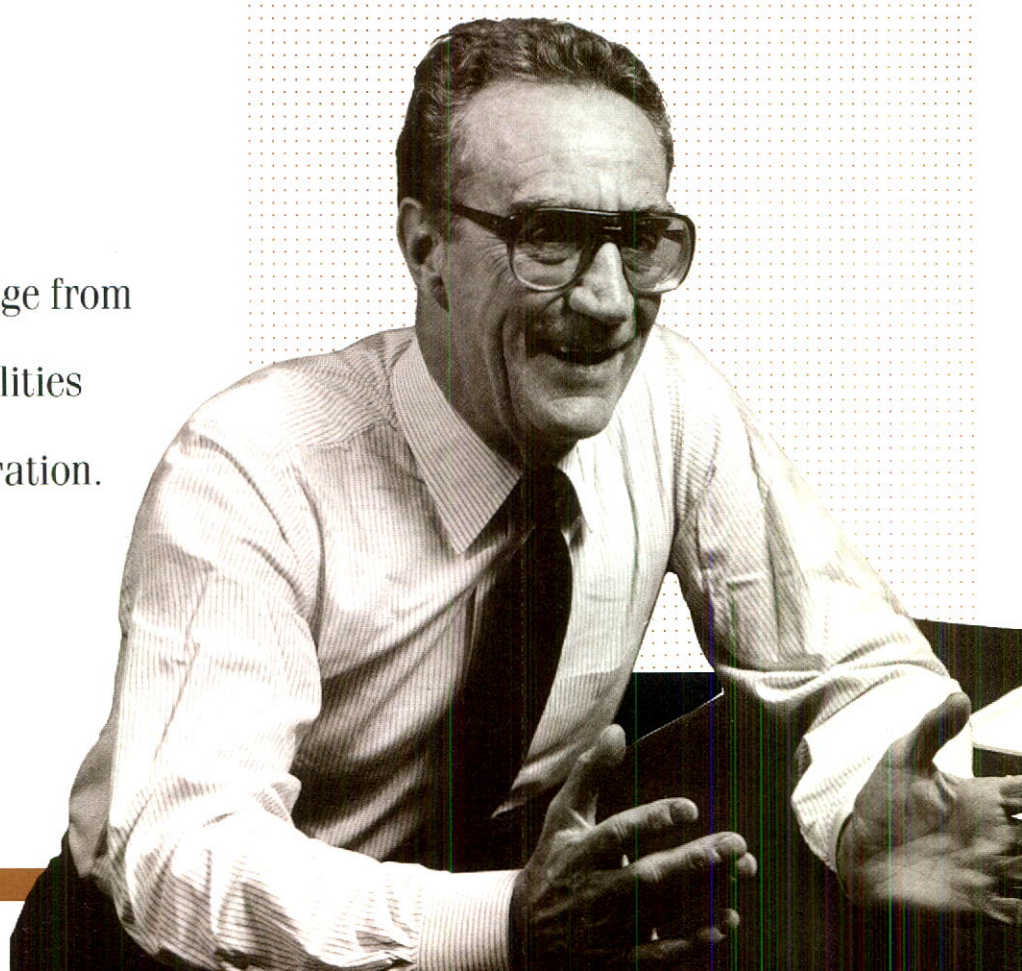
Many, for example, received financial support for part-time academic studies that, at first glance, would appear to have only a tangential relationship to their working lives. I believe, however, that the acquisition of knowledge from any academic or scientific discipline is a worthwhile endeavor because it contributes to personal growth and intellectual development.

THE ENGINEER who has acquired an easy familiarity with the arts and literature has become, in my view, a better engineer. Similarly, the marketing representative who has developed a solid conceptual understanding of the processes of science and technology has inevitably grown both as an individual and as a contributor to Northern Telecom's corporate progress.

For this reason, I believe that the costs of supporting employee education and training are not an expense, but a strategic investment that will eventually earn high returns for Northern Telecom and for those employees who become involved. Someone once said, "If you think education's expensive, try ignorance". I believe that is a perception well worth remembering in calculating the real price of the education investment.

IN A SENSE, those of us employed in high-technology industries sell nothing more than ourselves. The raw materials from which our products are made are relatively inexpensive; the products themselves only have as much value as our customers are willing to give them. The value added that we contribute is therefore only as great as the creativity, innovativeness, skill, technical knowledge, and personal understanding that we ourselves possess: all of these qualities are enhanced through education.

We cannot, however, develop these qualities in isolation from the society of which we are a part. The quality of the public education system is of deep concern to us because its success can have such a profound impact on our own.



If the young people who come to us seeking employment have neither an understanding of the crucial new technologies nor the skills to use them effectively, our growth as a corporation could be seriously jeopardized.

The implications for future job security and career advancement are obvious.

For this reason, in 1983, Northern Telecom stepped beyond its traditional financial support of university capital campaigns and special programs to establish the University Interactions Program. The specific objective of this program was to support science education at the post-secondary level. By the end of 1984, about 50 universities throughout North America had become involved.

THE PROGRAM, which is managed by our subsidiaries at the local level, includes cooperative research with university departments and also provides incentives for professors to spend their sabbatical leaves working with Northern Telecom. In addition, it provides support to selected employees who continue their studies at the post-graduate and doctoral level.

A major part of the program is designed to increase the flow of top engineers into university teaching and research to improve and expand engineering faculties. Our funding support has enabled several universities to hire faculty members in scientific and engineering disciplines five years earlier than would have been possible without our assistance.

ANOTHER FEATURE of the University Interactions Program involves the fabrication by Northern Telecom of certain semiconductor designs submitted by Canadian university students as part of their course work. This aspect of the program — now in place in 25 universities — provides encouragement to students by allowing them to see how their designs actually function.

Obviously, Northern Telecom does not have the resources or the desire to assume the responsibility for directing the course of scientific education in North America. As a world leader in technological innovation, it does, however, have a unique perspective on education. This perspective has been tempered and shaped by the corporation's extensive experience in developing leading-edge products to meet the demands of a highly competitive international marketplace.

The insights we have acquired in our business dealings around the world oblige us to participate in the public debate over educational matters. To be credible participants, however, we must put our money where our mouth is.

The University Interactions Program is one way in which we can tangibly demonstrate our concern for education, but it cannot carry the burden alone. Even more important to Northern Telecom's future is the recognition by its individual employees of the significance of continuing education in their personal and professional growth.

EDUCATION is not a stage in life: it is a process. More than that, it is a resource for the individual that is not only inexhaustible, but increases in value over time. The highly competitive era in which we live, more than any other in history, demands that this resource be developed to its full potential.

W. F. Light

WALTER F. LIGHT
CHAIRMAN OF THE BOARD

Professor Louis Barnes, Harvard University (left), explains the current competitive environment to Northern Telecom engineers at Northern Telecom Canada's first five-day engineering development course. The course was a five-day live-in program held at York University in Toronto.

Much of Northern Telecom's success stems from its technological innovations. Like any high-technology corporation, we rise or fall on the strength of our products. But the way we bring our products to market, and the way we sell them, must be just as innovative.

NEARLY 10 YEARS AGO, in 1976, we made a series of announcements, collectively called Digital World. At that time, we became the first telecommunications manufacturer in the world to commit itself to designing and developing a complete line of fully digital switching and transmission products. Not only did we promise technology that would be more advanced than any other manufacturer's in the world, but we also created an event, a unique forum, that galvanized the entire telecommunications industry. It was that event, and our commitment to the promises we made there, that set this corporation on its present course.

Nearly two-and-a-half years ago, in November 1982, we announced OPEN World. It presented our vision of an Information-Age future in which voice and data would be integrated by using a digital switch and routed along the twisted-pair wiring already linking every desk in the modern office.

OPEN World established a planning framework and guidelines that would set the standards for the office of the future. As with Digital World, the event of OPEN World stirred the industry. It provided an orderly vision to replace the commercial chaos then paralyzing the marketplace. And, once again, it created a lead for Northern Telecom that our competitors had to follow.

In February, we held our Integrated Networks Systems/ Integrated Office Systems seminars. These events fulfilled many of the promises made by OPEN World. We introduced new products and services that would make fully integrated voice and data a reality. We proposed new developments for network services that will revolutionize their technology. It was, I believe, one of the most important marketing events in this corporation's history.

Over 100 years ago, the British politician William Gladstone said, "You cannot fight against the future. Time is on our side." Time may have been an ally in an age when the world moved more slowly. In the high-tech world of modern telecommunications and information management, however, time is a rival, challenging us to struggle constantly to maintain our competitive edge.

AS TIME PASSES, new technologies, new products, and new markets appear, disappear, and sometimes even reappear in changed form. Our task is to identify with insight those developments that are significant to our success and adapt our strategies accordingly.

UNVEILING THE FUTURE

Northern Telecom keeps the promise of the OPEN World in a dramatic series of announcements that herald a new era of integrated voice-and-data communications and a revolutionary network technology.

Last year saw two major events that will have long-term consequences for this industry, and Northern Telecom. IBM purchased Rolm, our principal U.S. competitor in the digital PBX market. During the same period, AT&T Technologies Inc. (formerly Western Electric) introduced its first computer systems and data terminals.

The U.S. telecommunications market was already fiercely competitive; the entry of the powerful marketing force of IBM made it even more so. AT&T's move into data products and computer technologies paralleled our introduction of the IOS product line several years ago. Voice and data technologies were finally coming together in the marketplace, with two of our strongest possible competitors staking claims to a share of this important business. It was critical, therefore, that Northern Telecom should make its next step a dramatic one.

THE IOS/INS presentations were held in California in February, before an invited audience of executives from North American and international telephone companies and Fortune 500 corporations in the U.S., Canada, and abroad.

The Integrated Office Systems presentations demonstrated the benefits of simultaneous voice and data services, the key features of the new DV-1 data/voice system. The DV-1 integrates many functions that were previously only available through the combined use of a digital PBX, a high-speed minicomputer, and a local area network (LAN).

THE DV-1 IS the world's first truly integrated voice-and-data system. Not only does it perform as a key telephone system and as a distributed data processing system, but it also can greatly speed up communication between computers. Built into the DV-1 is a powerful local area network that can, for example, permit IBM PCs to communicate at speeds greater than one million bits per second. By comparison, they can currently communicate at only about 1,200 bits per second.

Enhancements to the SL-1 and SL-100 are providing similar features so that our existing installed base can be upgraded to match this new level of performance. This is consistent with the OPEN World pledge of continuity which guarantees that our current line of products will never be made obsolete because of incompatibility with newer generations of products.

The subject of the INS presentations centered on network capabilities and future demands. Although the existing telephone network efficiently handles voice transmission, it was not designed for data transmission and has serious limitations in performing this role. The new, digitally encoded services that will be offered in the future will likely exacerbate an already difficult situation.

At Northern Telecom's INS presentations, we proposed a solution: Dynamic Network Architecture. This proposal involves the creation of a new line of hardware and software products to enhance the digital network of DMS-100s and thus provide customers with a new level of services and features. These will eventually include "bandwidth on demand," a feature that will provide the user with dynamic — rather than static — access to extraordinary transmission and network capacities as needed.

THE SPIRIT of the IOS/INS presentations was visionary in concept but founded upon realistic analyses of today's marketplace. It is a vision that is supported by a major research-and-development effort, and is driven by Northern Telecom's commitment to excellence in all its fields.

The current success of Northern Telecom is founded upon our ability to create new technologies and products that meet emerging market demands. The future of Northern Telecom will depend upon our continuing ability to maintain our innovative spirit and our sense of excitement as we confront new challenges and opportunities.

We cannot rest on our past achievements; our industry is moving too quickly for that. And we cannot hesitate or hold back, for time is no friend of those who would stand still.

Edmund B. Fitzgerald

EDMUND B. FITZGERALD
PRESIDENT AND
CHIEF EXECUTIVE OFFICER

Executives from North American and international telephone companies as well as Fortune 500 corporations examine Northern Telecom's new Meridian line of integrated voice-and-data products at the IOS seminar held in Laguna Beach, California.

ITEM: Fire ravages a San Francisco accountant's office at the height of the tax season, destroying a new SL-1M digital PBX. Within 13 hours, a Northern Telecom Inc. team installs a new system and the office is back in business.

ITEM: Lightning knocks out a Bermuda hotel's SL-1. Replacement circuit packs from the Santa Clara, California plant are bumped off the airplane by a shipment of lettuce. Dennis Arnold at Northern Telecom (CALA) Corporation arranges to fly the shipment to Bermuda via Atlanta. Less than 36 hours after the problem was reported, the system is up and running.

ITEM: A DMS-100 line module frame destined for New Brunswick Telephone is damaged by movers while in transit to a new office, delaying a planned expansion of the company's service. The delivery time for a frame replacement is normally 28 weeks; in this case, replacement parts are provided, and the necessary repairs completed, within four days. The expansion proceeds.

The men and women who responded to these emergencies represent thousands of Northern Telecom employees who deliver outstanding service to the corporation's customers in every part of the world every day. Whether it's a crisis or a routine problem, Northern Telecom researchers, service engineers, technicians, and repairmen provide the kind of ongoing support that sells the customer and keeps him sold.

CUSTOMER ORIENTATION

"Service begins in the executive suite," says Edmund B. Fitzgerald, Northern Telecom's president and chief executive officer. "It implies a total customer orientation — knowing them, listening to them, planning with them, and responding to their needs and requests."

Service is, therefore, a continuum that begins with the development of practical, innovative responses to customer needs. It includes flexible financing plans and working relationships, and extends through after-sales service, including maintenance and repairs.

VITAL FACTOR

Service is a particularly vital factor in today's changing marketplace. As a result of deregulation in the U.S., Northern Telecom is being "tried out" by many of the Bell operating companies, as well as major private sector firms. Superior technology often makes the initial sale, but subsequent sales depend on excellent service.

A broadening customer base requires the development of fresh approaches to service, says Paul Brander, director, international major account sales, Northern Telecom International.

"Private-sector organizations have requirements that are different from the telephone companies," he explains. "The phone companies demand a self-maintaining product that operates at 100-percent efficiency; private firms also expect top efficiency but, since they won't pay for perfection, their systems occasionally run into trouble. We must be prepared to respond to any problems."

The service imperative

TODAY'S MARKETPLACE DEMANDS INNOVATIVE RESPONSES TO CUSTOMER NEEDS

Good customer service means keeping the products up and running. But more than that, it's a frame of mind, a way of approaching business. It's the realization that our long-term survival depends on service excellence.

A worker begins cleaning up after a tornado that devastated the town of Manson, Iowa. Although the tornado destroyed the local phone company's central office, Northern Telecom employees helped restore telephone service within a week.

R&D

To ensure that Northern Telecom remains responsive to market demand, the corporation is establishing R&D labs and regional offices close to its customers in North America and Europe.

A Bell-Northern Research (BNR) lab on the campus of Georgia Tech in Atlanta places the corporation near Bell South, a major U.S. telephone company, and MCI Communications Corporation, the largest non-Bell long-distance operating company in the U.S.

In Edmonton, BNR staff work with Alberta Government Telephones conducting field trials of Northern Telecom's fiber-optics products and systems. Edmonton is also the corporation's transmission headquarters, providing a further opportunity for close contact between designers and users.

In the United States, Northern Telecom Inc. (NTI) is establishing three new, full-service regional offices. They will give the company a total of six such offices across the country.

"The regional offices are staffed by customer service, marketing, engineering, and human resources people," notes Bob Drake, vice-president, customer service, Integrated Network Systems, NTI.

"Customers visit these offices to discuss their needs with our marketing people, enabling us to develop the products and service plans they want."

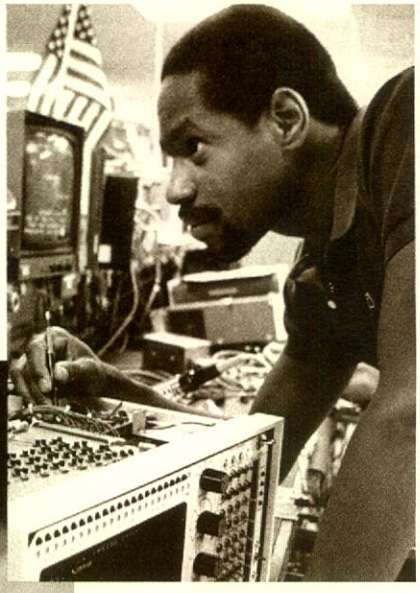
The same process is at work internationally, with regional sales directors serving as the corporation's eyes and ears in 25 sales offices around the world.

USER CONFERENCES

To encourage a cooperative relationship with customers, many Northern Telecom divisions hold user conferences on a regular basis. These conferences often produce

Dorothy Nicholls, manager, Seminar Support and Kevin Bowyer, manager, Integrated Systems Seminars, (right) demonstrate SL-1 Data benefits to Bob Brothers, marketing manager, NEDCO, Quebec, at the NTC Systems Demonstration Centre in Islington, Ontario.

Betty Hegarty and Brad Burrow, call controllers, take questions from callers at the National Service Support Center in Richardson, Texas. The NSSC helps to ensure that Northern Telecom IOS customers receive the best possible service.



Technician Henny Hill repairs a D601 DATASCOPE at Northern Telecom's Moorestown, New Jersey plant.

A sale is saved

Northern Telecom employees clear regulatory hurdles to bring DMS to China on schedule

Thanks to the commitment of Northern Telecom employees, the city of Shekou in the People's Republic of China got badly needed telephone service 13 weeks ahead of the normal delivery schedule.

The commitment was needed to successfully complete the sale by Northern Telecom (Asia) Limited of a DMS-10M central office switch to the Shekou Telecommunications Company. The switch provides up to 1,800 lines for subscribers in the Shekou economic region of southern China.

Shekou is a fast-growing industrial area near Hong Kong. When the contract was signed late last April, the buyer insisted that the DMS-10M had to be delivered by September because Shekou was running out of telephone lines.

"The Chinese made it clear that they would cancel the sale if it took any longer," recalls Marcia Downs, manager, international trade compliance, Northern Telecom Inc.

UNDER NORMAL CIRCUMSTANCES, a deadline of three-and-a-half months to deliver a DMS-10M isn't a major obstacle. But this was far from a normal situation.

Because the switch was destined for the Peoples' Republic of China, delivery required special approval from the U.S. Commerce Department. This, in turn, had to await the approval of several U.S. Government departments and agencies, and COCOM (the Coordinating Committee to Control Strategic Exports), an international export-control organization. Normally this process takes about six months.

Once the agreement was struck, NTI employees immediately went to work. They first applied to the U.S. Commerce Department for an emergency export license, which would permit the DMS-10M to be sent to Hong Kong.

AT NTI'S REQUEST, Commerce waived the requirement for a Hong Kong import certificate. The license was approved in one week, permitting NTI to ship the DMS-10M to Hong Kong, close to its ultimate destination, where it awaited the other approvals.

"This assured the customer that the switch was available and that we weren't hiding behind a wall of government red tape," explains George Leung, sales and marketing director, PRC, Northern Telecom (Asia) Limited. "It also ensured that the switch would reach Shekou as quickly as possible after we got the final approvals. If it had been held in Raleigh until then, delivery would have taken almost three weeks; by sending it first to Hong Kong, which isn't on the COCOM restricted list, we reduced delivery time to less than two days."

Meanwhile, extensive representations by Northern Telecom employees resulted in the sale being approved by the Defense Department and the State Department. Northern Telecom allayed their concerns that the switch might be used for military purposes by agreeing to visit Shekou regularly over the next six years to confirm its civilian use.

At the same time, attention was focused on speeding up approval from COCOM.

"It can take eight weeks for a case to reach COCOM," Downs says. To speed up the process, the application was personally delivered to COCOM in Paris along with a letter explaining that without quick approval the contract would be cancelled.

The company also appealed directly to COCOM nations, including Canada, the United Kingdom, and Japan. The result was approval within a month.

Immediately, Northern Telecom informed the U.S. Commerce Department, which issued a license for the DMS-10M to be exported to the People's Republic of China. The Commerce Department then telexed the U.S. consulate in Hong Kong which, in turn, notified Hong Kong customs officials that the switch could be delivered.

On September 5, the switch arrived in Shekou and was put in the hands of installers from Research Triangle Park, who had carried out a site inspection months earlier.

THEN ANOTHER HURDLE AROSE. The system couldn't be powered up because of a defective power plant. This delayed testing until a power plant arrived from Raleigh. On December 2, the cutover to Shekou Telecommunications was complete, some eight months after the deal was signed and far ahead of the normal schedule.

Northern Telecom's first sale of a central office switch to the People's Republic of China presented a special challenge. To meet that challenge, the corporation and its employees took the extra step needed to satisfy the customer and complete the sale.

Randy Haskins (right), manager, DMS-10 Printed Circuit Pack, System Test and Final Inspection, briefs a delegation from the Embassy of the People's Republic of China.

suggestions that improve the corporation's products and services.

For example, the extended warranty program for DMS-100s offered by the general switching division of Northern Telecom Canada is a direct result of a customer recommendation, says Gerry Butters, the division's director, customer service and installation.

Post-sales service provides Northern Telecom with a special challenge. Some customers, such as small telephone companies, want the corporation to provide full maintenance and emergency assistance; larger firms have internal maintenance centers and call on Northern Telecom only when a problem is too technical to solve internally.

"Whatever the case, we're committed to providing fast, efficient service, particularly in emergency situations," Butters says. "If your switch goes down and knocks out your phone service, we'll do everything possible to restore it within 15 minutes."

Service and maintenance people are most visibly involved in repair work but senior managers also play a key role, according to Glenn Shackelford, branch operations manager, Integrated Office Systems, NTI.

"If there's a serious problem with a system, the field technician calls the National Service Support Center in Richardson, Texas," he says. "At that point, a vice-president contacts the nearby BNR lab, which helps to solve the problem as quickly as possible."

QUICK RESPONSE

But the whole process boils down to how quickly and effectively the corporation responds when the need arises. Five years ago, the corporation helped restore telephone service to Manson, Iowa, just one week after a tornado ripped through the town, destroying the local phone company's central office.

Normally, it takes two years to replace a central office; in this case, General Telephone Company of the Midwest needed a replacement within five days. NTI agreed to supply a DMS-10 digital switch. It arrived 10 hours ahead of schedule. Three days later, full service was restored to all of the subscribers whose homes were still standing.

Fortunately, most service needs aren't the result of major disasters. But whatever the challenge, the commitment is the same: keep the customer happy. In the long run, it's everything.

Gerry Butters (left), director, customer service and installation, works with Valentin T. Flores at the Technical Action Center, Bramalea, Ontario.

Northern Telecom holds regular user conferences as part of its commitment to service excellence. Attending a reception in Dallas for SL-1 users are: (left to right) Lee Stewart of First Tulsa Bank, Tulsa, Oklahoma; Bob Coria of Hillcrest Medical Center, Tulsa; and Carol Mansinne of Alta Bates Hospital, Berkeley, California.

Controlling costs

THE IMPACT OF INVENTORY

Careful management of corporate assets improves productivity and creates jobs. Inventory control plays a key role in achieving market success and profitability.

The factory floor at Research Triangle Park is as brightly lit as a movie set; and under the bright lights stretch DMS-100s, as far as the eye can see. Hundreds of the large, fully digital central office switches crowd the more than 265,000 square feet of floor space in every state of assembly from bare frames, to final testings and burn-ins, to crated systems ready for shipping. On the side of each frame is taped a sheet of paper with its destination, because each system is specifically configured for its particular customer.

The labels tell the overwhelming success story of DMS-100, the best-selling large digital central office switch in North America. The switches are destined for Baton Rouge, Louisiana; Buffalo, New York; Grand Rapids, Michigan; Ossining, New York; Middleton, Pennsylvania; Starkville, Mississippi; and hundreds of other towns and cities across the United States.

The market success and the profitability of the DMS-100 and many other Northern Telecom products depend, in large part, on what happens on the factory floors in RTP, Bramalea, Belleville, Santa Clara, and every other plant the corporation operates. One of the key elements in this factory-floor operation is inventory management.

DAYS OF INVENTORY

Inventory is materials on hand — raw work-in-process and finished goods. It is usually measured in terms of "days of inventory." This phrase refers to the total amount of material needed to support a day's worth of sales. For example, when the SL-1 plant at Santa Clara, California, installed Northern Telecom's computerized Production Management System (PMS), they doubled the "productivity" of their inventory use by reducing their inventory days-on-hand from a high of 120 days to less than 65.

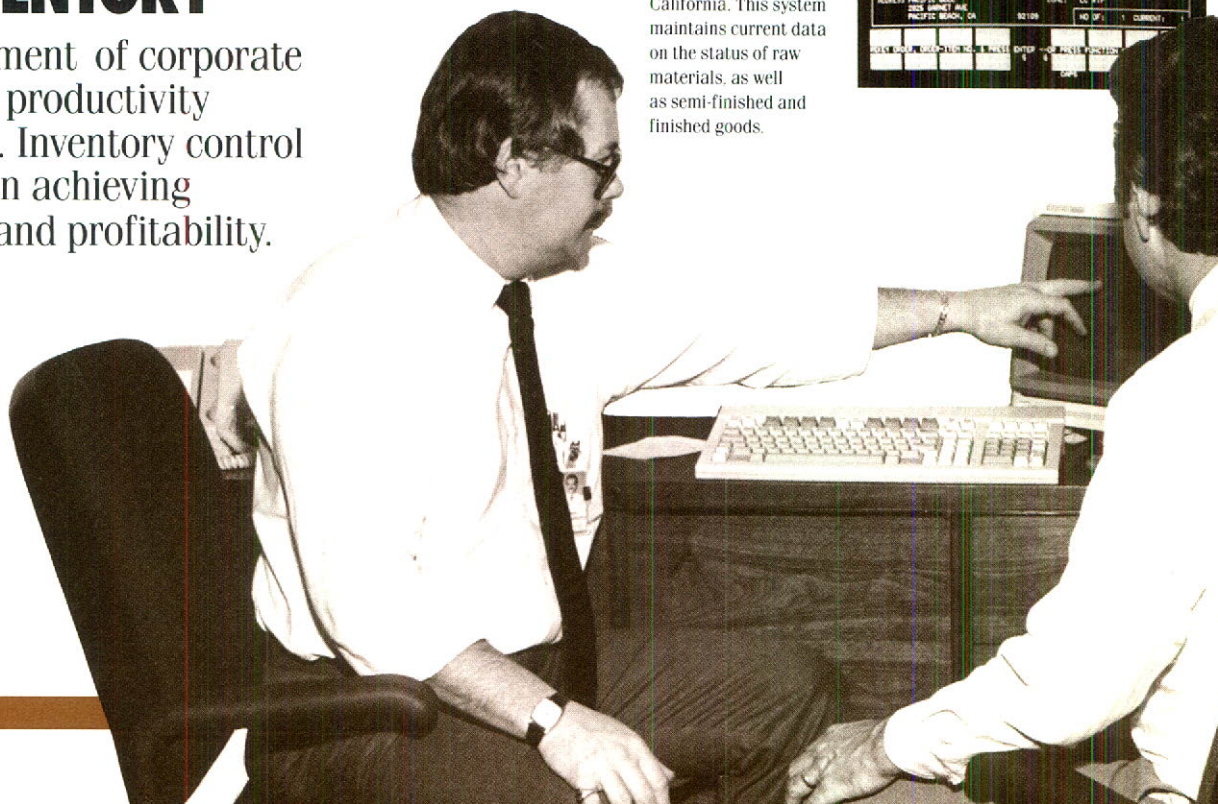
In its simplest terms, inventory control for any business is a constant balancing process between goods and materials on hand, production capacity, and sales orders or forecasts. Just as Northern Telecom has experienced major sales growth, so has our inventory grown — it now represents 50 percent of our total operating capital. But while our sales growth requires a concomitant rise in our inventory levels, careful management is needed to keep inventories from growing out of hand. Excessive and unnecessary inventory ties up cash and generates interest charges — money that could otherwise be used to buy equipment that would create more sales and, ultimately, more jobs.

That's the problem. The solution is to optimize the level of inventory. This means ensuring that the quantity of inventory on hand is sufficient to maintain our reputation for fast response to customer needs while minimizing the amount of cash we have tied up in that inventory. Inventory costs money. That's the first lesson of inventory control.

GIGANTIC VOLUME

At any given time, there is about $200-million worth of inventory on RTP's factory floor. The volume is

Northern Telecom's Production Management System (PMS) displays the status of a customer order for a DMS-100 which will go into service in Pacific Beach, California. This system maintains current data on the status of raw materials, as well as semi-finished and finished goods.



Bob Wigglesworth, director, materials, Digital Switching Systems, (left) reviews statistics on material input with Jim Gockel, purchasing manager, at RTP.

gigantic. Circuit packs are being produced at RTP at the rate of 500,000 per month. To make them requires over $1 million worth of microchips every week from Rancho Bernardo. "Forty to fifty million dollars worth of material comes through here every month," says Robert Wigglesworth, director, materials, Digital Switching Systems, NTI.

INTEREST COSTS

Not only is the direct cost of the inventory dramatic, but the interest charges on the tied-up money can be staggering. The calculation is not difficult. The cost of borrowing $100 million for 12 months at 12-percent interest is $12 million. Obviously the importance of reducing such costs cannot be overstated.

Inventory control also performs a key role in the manufacturing process, says Wigglesworth. "You begin with materials management, which takes the marketing forecast and develops a manufacturing plan. At the same time, purchasing places orders for material, receives it, and stores it in stockrooms." The broad umbrella of inventory control also covers such areas of specialization as materials handling, shipping, warehousing, and distribution; at RTP, all of these areas fall under Wigglesworth's responsibility.

The responsibilities of inventory control are enormous because effective inventory control directly impacts on our ability to serve our customers and, ultimately, on the financial well-being of the corporation. And that affects everyone.

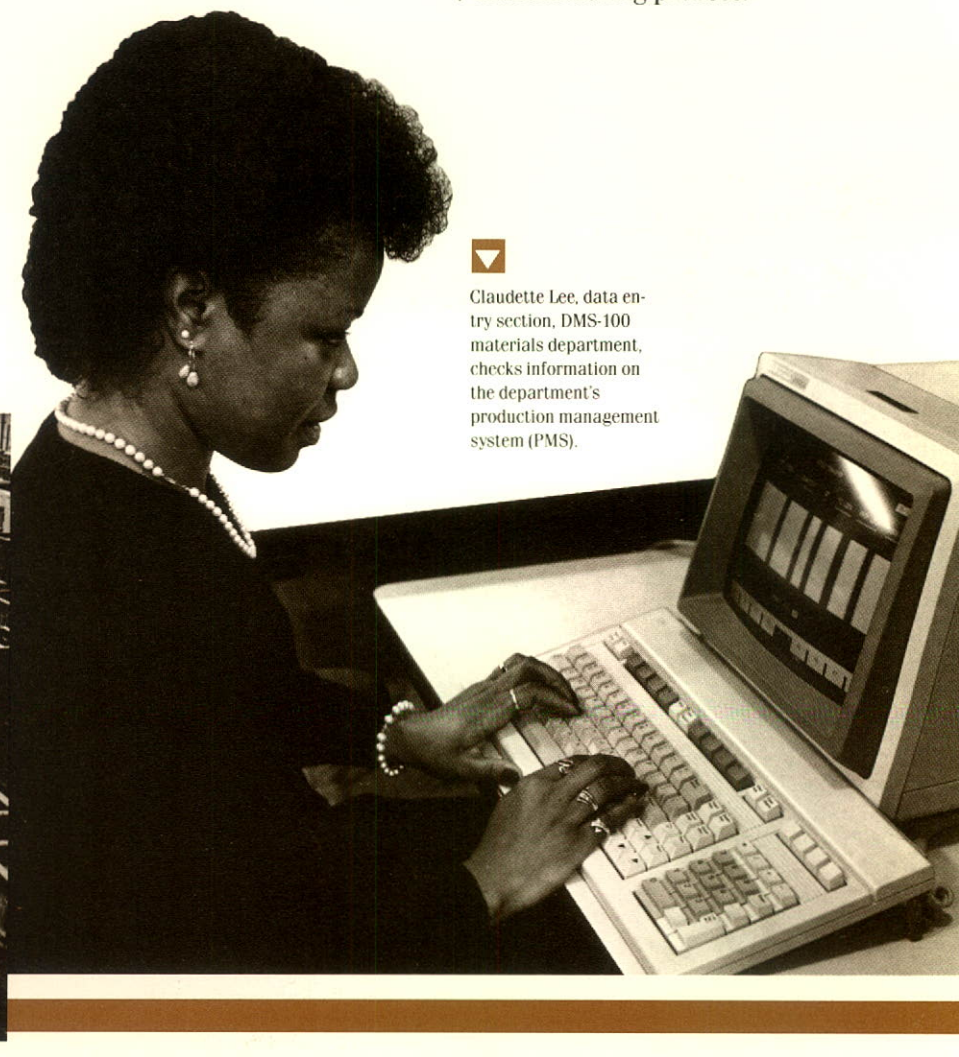
JUST IN TIME

But not everyone views inventory the same way. In the 1960s, back when Japanese quality control was notoriously bad, the Japanese undertook a major effort to correct the problem and perhaps by accident also discovered how to improve inventory management. They put more emphasis on process control as a means of improving quality. As a by-product of this improved process control, they discovered that costs had been reduced as well. But lower inventories also revealed process problems. Some Japanese manufacturers, particularly Toyota, moved to a system called Kanban, a "just-in-time" inventory-management process. These companies found that by using suppliers located near their plants and increasing the frequency of supplier deliveries, they could reduce their own inventory on hand. Ideally, the supplier would deliver "just-in-time," as needed.

In fact, some Japanese manufacturers view the production of goods as a continuous process, involving a highly integrated supplier-manufacturer relationship, in which excess inventory is not needed as a safety measure. This marks a major departure from the orthodox manufacturing approach where, traditionally, inventory was considered an asset that provided safety and protection in case of errors in the supply and manufacturing process.

DMS-100 frames at various stages of completion in the assembly area at RTP.

Claudette Lee, data entry section, DMS-100 materials department, checks information on the department's production management system (PMS).



MURPHY'S LAW

In the past, many North American manufacturers used inventory as a means of combating the potential consequences of "Murphy's Law." If something went wrong, the inventory served as a kind of expensive safety cushion; rather than take action to eliminate recurring problems, many North American managers built a wall of excessive inventory to hide their manufacturing difficulties.

This approach to inventory control, however, relied on the relatively low inventory costs of the past. Fifteen to twenty years ago, direct labor costs were the largest component of our manufacturing costs, adding about 70 percent to the total value of a product. Material costs were relatively small as a percentage of the total product cost. These low costs encouraged wasteful, inefficient attitudes — including the building of inventory at various points throughout the factory "just-in-case" it might be needed.

Today, however, materials are expensive, representing about 70 percent of Northern Telecom's manufacturing costs. And it is now important to make our inventory more productive, both to minimize the amount of cash it ties up and to reduce interest charges.

At RTP, says Alan Lutz, vice-president and general manager, DMS-100/200, NTI, "The overall health of the business, and therefore our employees' job security, depends on management's ability to anticipate market demand and manage total operating resources to generate profit."

PMS

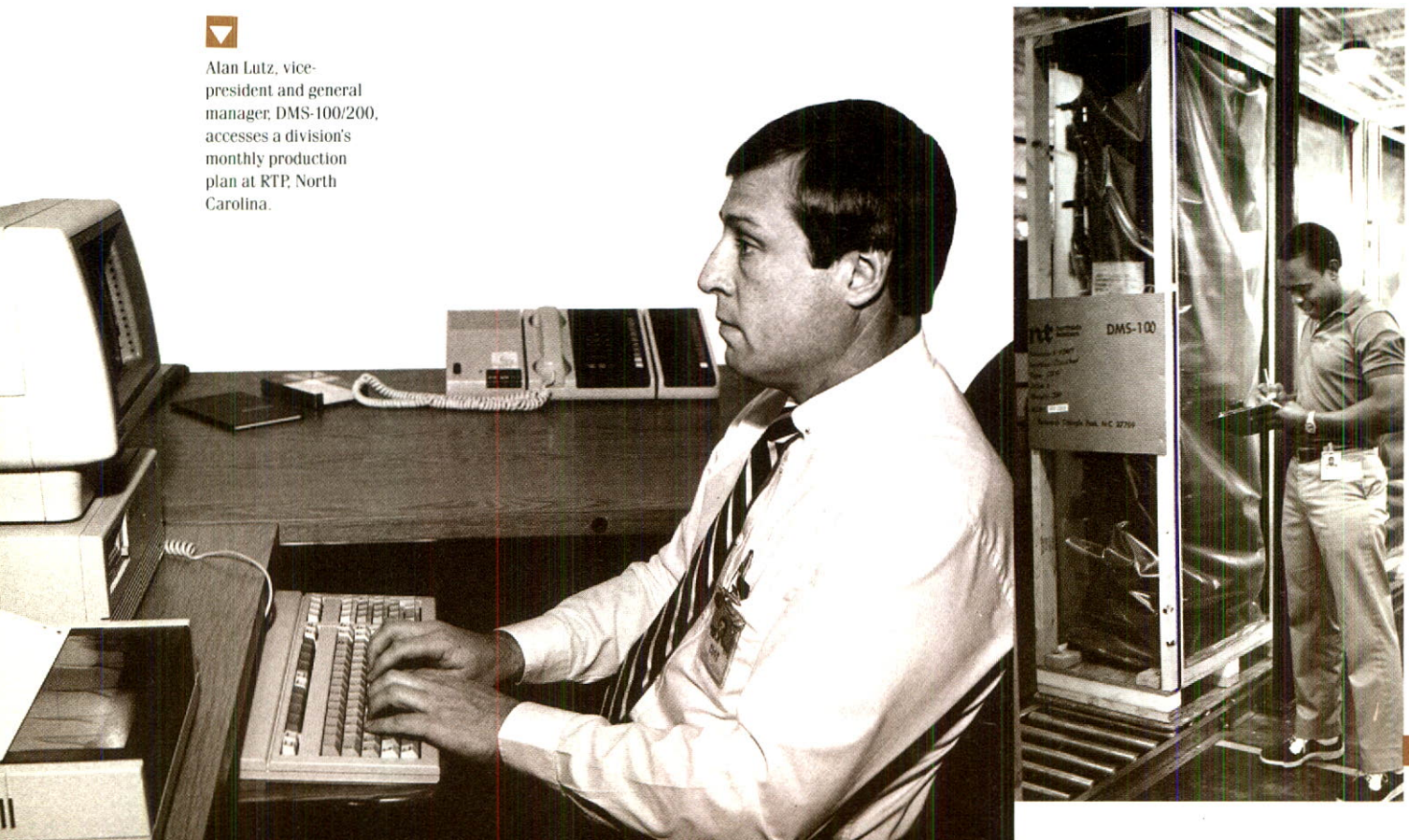
In the late 1970s, Northern Telecom's management, recognizing a need for improved inventory control, adopted a standard, computerized system. This system, called Production Management System, or PMS, has been installed at every Northern Telecom plant and warehouse to record, track, and analyze inventory on hand, and to plan inventory for future needs.

The computerized PMS system uses marketing forecasts of specific product sales to determine the type and quantity of raw materials that will be required for the manufacturing process. It also establishes schedules for moving product through the shops.

AVERAGE BALANCE

PMS saves the corporation money by reducing the average balance of components on hand. It does this by providing weekly updates of the amount of inventory on hand and comparing them with specific future orders, normal purchasing-lot sizes, and purchasing lead times for specific components. While manual inventory systems usually base raw-material purchases on an annually-averaged usage rate, PMS allows us to buy components based on actual orders.

For example, Don Patterson, materials manager, General Switching Division, NTC, in Lachine, Quebec, supplies connectors and sheet-metal products for the DMS-100s being assembled at RTP. When marketing forecasts determine the number of DMS frames that RTP expects to sell, he plugs that information into his PMS system.



Terry Nolen, shipping department, RTP, does a final check on a DMS-100 frame prior to loading on a company truck.

Alan Lutz, vice-president and general manager, DMS-100/200, accesses a division's monthly production plan at RTP, North Carolina.

which then calculates the number of connectors he will need to supply. That, in turn, tells Patterson how much raw material he'll need to order, how many component parts will have to be manufactured, and the appropriate scheduling. "If we do the job of planning right," he says, "the output should match the input."

MASSIVE AMOUNT

Corporate-wide, the total inventory of NTC, NTIL, NTI, and NTE exceeded $1.1 billion at the end of 1984. At NTI alone, slightly more than 1,000 people managed approximately $550 million in inventory to support $2.8 billion in sales. The manual system previously used would have choked on the massive amount of data needed to manage these inventory levels.

Northern Telecom's overall business has experienced explosive growth, with sales of DMS leading the way. Total revenues from DMS have grown to $1.6 billion in 1984, from $962.4 million in 1983, a 67.8-percent increase.

To cope with RTP's present rate of growth, says Lutz, "requires a great deal of management skill which, in this case, means running the system with a little more art than science." As he explains, "1984 was a period when the computer-aided tools had to catch up with our growing business requirements."

Now, those tools have caught up with our needs. RTP will have the largest data center in Northern Telecom.

But, as Lutz explains, "The computer only takes care of the bookkeeping." It doesn't replace the human factor. If an emergency occurs, if parts are defective, lost, or accidentally destroyed, human beings must devise contingency plans and initiate back-up procedures.

People still have to decide, Lutz says, "whether you're willing to pay $5 more for a part to have it delivered tomorrow — if the result of not having it for another five or six days is to shut your production line down."

CYCLE TIME

Computerized inventory-management systems, however, are only one part of the answer. The computerized PMS system is one of two major drives underway within Northern Telecom to reduce inventory levels. The other is a corporate-wide effort to reduce the "cycle time" needed to manufacture our products — the length of time from the initial date of the customer's order to the date of delivery.

Bill Greenhalgh, assistant vice-president, manufacturing, NTL, says, "This is being accomplished through a mixture of investment in new production equipment and changes in how we actually schedule our production in the factory."

As Greenhalgh explains, "Typically, a major system being manufactured by Northern Telecom or most other companies may be in the factory for 20 weeks. During that period, it may be worked on for less than five percent of the time." For the remainder, it is being moved around the factory, waiting for a machine to become available, waiting for a machine to be adjusted, or just sitting around as work-in-process — as part of a large batch.

PROCESS TIME

"We want the manufacturing cycle time (the time during which the product is in the factory), to move closer to the process time (the time during which work is actually being done on the product). We can do this by eliminating waiting time through better production scheduling, by reducing batch sizes of the products we make, and by reducing machine set-up time. If we can

Keith Powell (left) watches Clark Weddell operate new parts picking conveyor system at Northern Telecom's plant in St. Laurent, Quebec.

achieve this, it's possible we could cut our inventory by half."

While we reduce our inventories, we also want to maintain and improve our responsiveness to customer orders. This goal is encompassed in the phrase "make-to-order," rather than "make-to-stock." Instead of guessing what a customer might want, and then holding it in stock until it is needed, we ensure that we have the manufacturing capacity and processes to take a specific customer's order and make it in a time that meets his needs. "Why build inventory," asks Greenhalgh, "when it may be preferable to use the money to build additional capacity, reduce set-up time, and make products to order, thus increasing sales and creating jobs?"

ENORMOUS PAYOFF

This, he adds, has the two-fold advantage of giving the customer what he wants when he wants it and reducing Northern Telecom's immediate inventory. "This is the ideal," he says, "and the long-term objective we must aim for. It certainly is not an easy goal, but the payoff will be enormous."

But, as Lutz explains, the ideals and goals of inventory control must be consistent with the goals of the business being managed. "If this were a very stable situation, there's no question that we would be running our inventory differently."

By contrast, the Lachine, Quebec, plant operates in a relatively stable, mature market environment, where growth is linear rather than exponential. Consequently, the forecasts for Lachine tend to be more predictable than the rapidly expanding markets for RTP's products. "We are primarily a 'make-to-order' supplier," says Don Patterson. "But over the last year, we have been converting our connector product line to a production management system."

CONTINUOUS CANVASSING

To do this requires a continuous canvassing of other Northern Telecom divisions to determine anticipated usage and then to plug that information into the PMS system.

Patterson's system represents the orthodox response to inventory management. The basic approach is simple: improve the return on investment by lowering the asset base, or inventory.

The "just-in-time" approach to inventory management has worked well for the Japanese, especially the car-makers, but cannot always be applied too literally in other industries, especially those involving high-tech electronics. Such industries may require only small quantities of components and specialized parts. In North America, suppliers are often remote from their customers (unlike the Japanese suppliers, who may be only a few blocks away). A final difference is the nature of the supplier-customer relationship: in Japan, suppliers frequently serve only one client; North American suppliers typically avoid depending on a single customer and prefer to serve a broad customer base.

REAL IMPACT

At RTP, rapid growth is expected to continue, and it will be controlled by a skilled work force using the modern tools of computerized inventory management. As market share expands in different regions, and as new products blossom while older ones wither, the great challenge for our inventory-control specialists will be to manage the ever-increasing percentage cost of materials. However computerized our inventory control systems may become, the real impact will always be found in the application of human skill and experience to the challenge of managing *all* of our corporate resources effectively.

Cindy Chung, machine operator, and Bill Greenhalgh, assistant vice-president, manufacturing, NTL, examine a surface mount machine at Bramalea, Ontario. This machine is used to place surface-mounted components on the DMS-100 line card.

A second technology transfer

THE REPUBLIC OF TURKEY JOINS THE DIGITAL WORLD OF ECONOMIC PROGRESS

In 1967, Northern Telecom and the Turkish PTT created a company called Netas as a joint manufacturing venture. Today, Netas is the largest telecommunications manufacturer in the Middle East.

The country of Turkey is an ancient land, rich in history and tradition, but with its eyes fixed firmly on the future. Recognizing the crucial importance of advanced telecommunications to economic development, the Turkish PTT (Post, Telegraph and Telephone Administration) became part of the Digital World on December 18, 1984.

CUTOVER CEREMONY

The scene was the PTT central office building in Kavaklidere, a suburb of Ankara, the national capital. The host was General Servet Bilgi, chairman of the board and director-general of the PTT. The distinguished guests included His Excellency Veysel Atasoy, minister of communications, Basil A. Beneteau, vice-chairman of Northern Telecom Limited, Leslie A. Cox, managing director of Netas, the Turkish telecommunications manufacturing company, and many of Ankara's most senior public-officials. The event was the cutover ceremony commemorating the installation of the country's first digital central office switch — a Northern Telecom DMS-10M.

In his welcoming address, General Bilgi said the new digital switch was the first of many projects planned by the PTT to ensure that Turkey's telecommunications network becomes one of the most advanced in Europe. He thanked Northern Telecom's employees "for the help they have given our country in developing its telecommunications network," adding "we can show to the world the cooperation among Netas, Northern Telecom, and the PTT as an example of international goodwill."

ECONOMIC PROGRESS

Mr. Atasoy noted in his remarks that countries without adequate communications networks will never be able to make economic progress. "We have to develop technologically to be included in the world telecommunications network," he said, adding, "the digital telephone exchange we have put into service is the result of such an effort."

Turkey's entry into the era of digital telecommunications is the culmination of a long-standing business association between the PTT and Northern Telecom which has stretched over almost two decades.

His Excellency Veysel Atasoy (right), Turkish minister of communications, examines a commemorative plaque presented by Basil A. Beneteau, vice-chairman of NTL and chairman of NTIL. Acting as interpreter is Faruk Kardicali, assistant general manager, commercial and public relations, Netas.

TECHNOLOGY TRANSFER

In 1967, Northern Telecom and the PTT created Netaş as a joint manufacturing venture in technology transfer. Northern Telecom originally owned 51 percent of the shares of Netaş; today, Turkish interests own 69 percent of the company, with Northern Telecom holding the remaining 31 percent. Netaş currently employs over 2,000 people — of whom only two are Canadians — and is the largest telecommunications manufacturer in the Middle East and the Balkans.

Northern Telecom's first supply program to Turkey during the years 1967 to 1972 consisted of Canadian-assembled crossbar telephone exchanges, and components for crossbar systems and telephone sets which were to be manufactured by Netaş. By 1972, Netaş, under Northern Telecom tutelage, had developed the in-house capability to assemble and partially manufacture crossbar exchanges and telephone sets.

In the years that followed, Northern Telecom continued to supply components, piece parts, raw materials, technical expertise, and training programs to the company's Turkish personnel. During this period of technology transfer, Netaş progressively increased the Turkish content of many of its products.

The eventual results of this initiative were reported by Cox, the managing director of Netaş, at a luncheon following the cutover ceremony.

HALF-MILLION RANGE

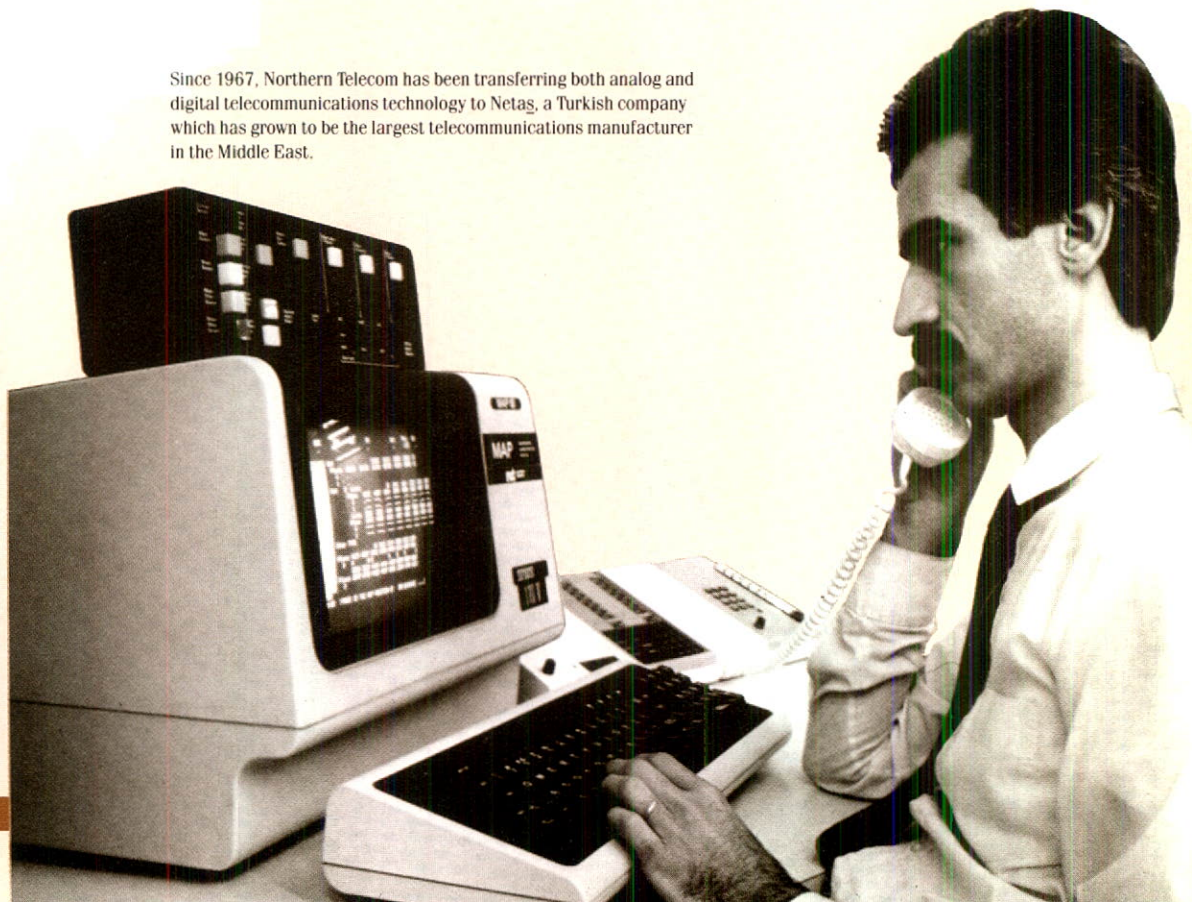
Cox said that in 1985 Netaş will produce its two-millionth telephone line and its two-millionth exchange line, in addition to manufacturing 250,000 lines of crossbar switching. He noted that in 1984 Netaş manufactured 300,000 telephones for the PTT, and predicted that 1985's total would be in the half-million range. (In 1967, when the Turkish PTT first chose Northern Telecom equipment to help revitalize its telecommunications network, there were only 275,000 telephone lines in the entire country.)

SPACENET PABX

Netaş maintains the largest private-sector research and development lab in Turkey and has developed several unique products. "The one of which we are proudest," said Cox, "is our SpaceNET private automatic branch exchange. It was completely designed and developed at Netaş by Turkish engineers and scientists." Over 500 SpaceNETs have been ordered by customers in markets in the Middle East.

Cox said the Netaş success story is a good example of the way in which foreign investment can provide benefits to all the parties concerned. "Northern Telecom has had a long and successful business

Since 1967, Northern Telecom has been transferring both analog and digital telecommunications technology to Netaş, a Turkish company which has grown to be the largest telecommunications manufacturer in the Middle East.



relationship with the Turkish PTT. Netaş has become the largest telecommunications manufacturing company in the Middle East. Because of it, the PTT has been able to introduce the most up-to-date digital technology in Turkey at the same time as it is being introduced to the rest of Europe."

He also noted that Turkey's close connections with other countries of the Middle East and its possession of the latest in advanced telecommunications technology should result in significant export sales of Netaş' products. In 1984, Netaş' exports sales were worth about half a million U.S. dollars.

WORLD-CLASS TECHNOLOGY

In his remarks, Basil Beneteau described Ankara's new DMS-10M switch as "a symbol of the wisdom and foresight of the Turkish government in welcoming the promise of world-class technology."

"I sincerely believe," he added, "that one of Netaş' major export strengths is its close association with the PTT and Northern Telecom. It combines the international know-how of the PTT with a technology born and nurtured in the most competitive, advanced telecommunications market in the world — that of North America."

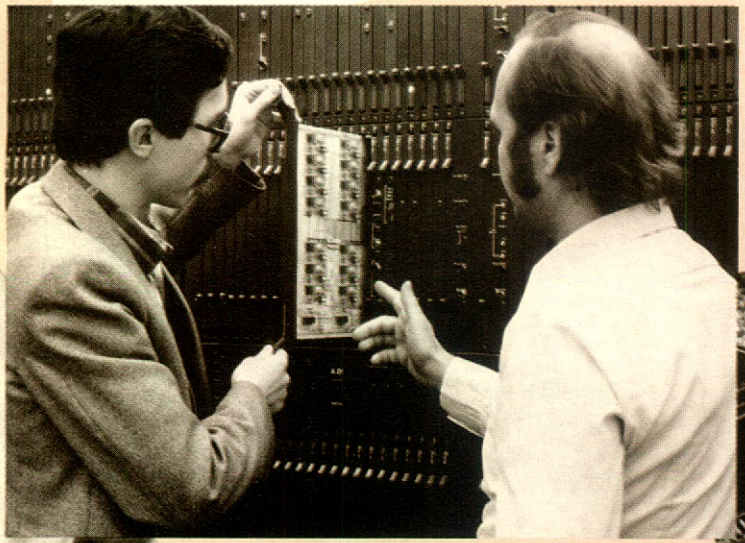
SECOND TRANSFER

In bringing digital telecommunications technology to Turkey, Northern Telecom effected a second transfer of technology which was unique in the history of world telecommunications. As a result, Northern Telecom's analog and digital technologies will remain major factors in the growth and enhancement of the Turkish telecommunications network in the years ahead. In 1985, for example, a second DMS-10M switch is scheduled to go into operation in Istanbul, Turkey's largest city.

Northern Telecom will also supply the PTT with three complete DMS-100 fully digital local telephone exchange systems and two DMS-200 long-distance exchanges.

BANNER YEAR

In addition, the PTT has ordered seven DMS digital exchanges from Netaş which will be manufactured under a licensing agreement with Northern Telecom. They will also be delivered and installed in 1985. For these reasons, Cox predicts that 1985 "will be a banner year for telecommunications in Turkey."



SL-1: A commitment to quality
THE PEOPLE BEHIND THE PRODUCT

Northern Telecom's success in North American and international markets has, to a large extent, depended on the individual commitment of its employees to quality and productivity. The financial projections and business strategies that guide the corporation's operations would be meaningless if our products were not manufactured with skill and pride, two intangible factors that have a direct and important effect on our corporate success.

The production of the SL-1 business communications system in Santa Clara, California, Belleville, Ontario, and Galway, Ireland demonstrates the power of these factors. Since its introduction in 1975, nearly 14,000 SL-1 systems representing four million lines have been sold in over 59 countries around the world. Employees working at Northern Telecom's two North American SL-1 plants describe their role in manufacturing and marketing the world's leading digital business communications system:

JOHN FRANKLIN, QUALITY ASSURANCE AUDITOR, SL-1 SYSTEMS, BELLEVILLE.

"I've been with Northern Telecom for 11 years. I am responsible for analyzing SL systems, packs, and telephone sets statistically to ensure that quality standards are maintained. I look at the product as I would a customer; through an audit, it can tell us how we're doing and where we need to improve. If we get good results in our department, then the real customer should be satisfied.

"If we see a bad trend developing in a sample of a certain product, we have the authority to shut down the line until the problem has been identified and corrective action taken. That rarely happens. In general, we get good feedback from the shop on what we find, and we don't often get a recurrence of the same problem.

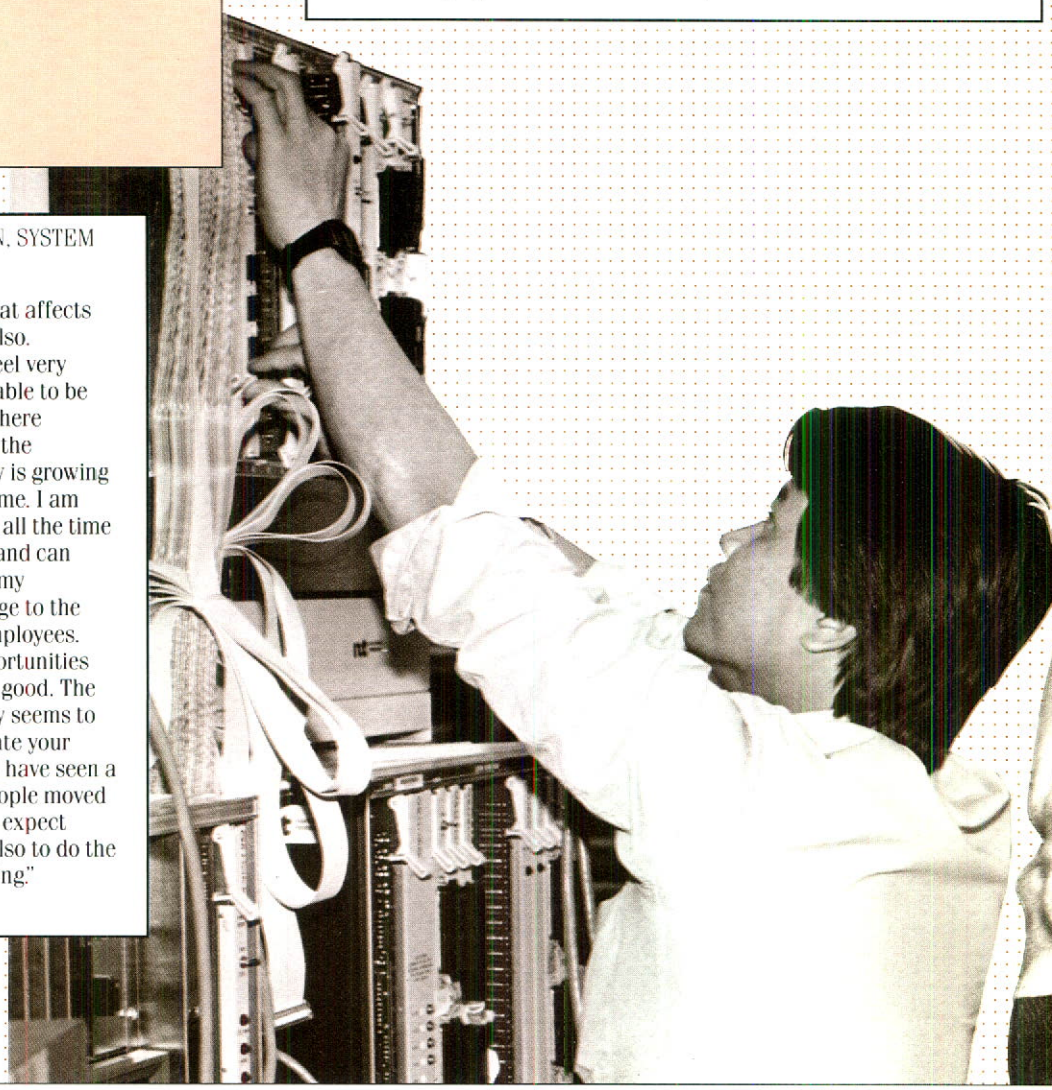
"I believe quality is important because if we don't have a quality product, we don't have jobs. In our department, we get involved in a lot of other areas, which makes the work interesting. For example, we'll often get queries from shop managers regarding what's acceptable and what's not. It's our job to make that judgment call.

"Most of us here feel that working at Northern Telecom is a source of pride. We're a world telecommunications leader with a very high profile. Our new product lines always make the newspaper headlines. It's nice to be a part of that."

HUNG NGUYEN, LEAD TECHNICIAN, SYSTEM TEST, SANTA CLARA.

"In our group, we test the SL system before it goes to system configuration for clean-up and final testing. We put the system in an oven for 48 hours at 120°F and check it out. We're one of the last steps before the product is shipped, so it's important that we are concerned about quality. Quality is important because it makes high value for the company to compete with other companies. If the company goes up or down, that affects my job also.

"I feel very comfortable to be working here because the company is growing all the time. I am learning all the time as well, and can pass on my knowledge to the other employees. The opportunities are very good. The company seems to appreciate your efforts. I have seen a lot of people moved up and I expect myself also to do the same thing."



ANN McDANIEL, LEAD OPERATOR, MOD AND TOUCH-UP, SANTA CLARA.

"I started here eight years ago. I was just going to work through the Christmas holidays — but I'm still here. Our department does the wiring of the circuit boards, the wiring of connectors, and we put in the face plates, among other things. We do a lot of manual assembly and checking to make sure that we keep up the quality of our products. We have very good employees who are proud of their work.

"Northern Telecom is recognized here as a company that pays good wages and has good benefits, like the retirement plan and thrift savings. Many of the people I know who have left the company have tried to get back in because of that.

"I like my job because there are so many different things to do, so many different boards to work on. There's never a dull moment, there's always something going on. It's just exciting to be here."

SANDY SEARLES, AMOS (AUTOMATED MERCHANDISE ORDER ENTRY SYSTEM) OPERATOR, MARKETING, BELLEVILLE.

"My job is to handle the orders coming in, to forward them to order estimating and, if they are accepted, to start the billing process. I've been here for five years and I feel that the company has been very fair as far as opportunities are concerned.

"To me, job satisfaction is everything. If you don't take pride in your job, then nothing else really matters. When you go home after work, you should feel that you've done the best job you can. A company is like a puzzle — everybody has a part to play. If one person doesn't do a good job, then the next guy has to make up the difference. Although it's hard to visualize the entire operation, we're all a part of it, and we're responsible for its success.

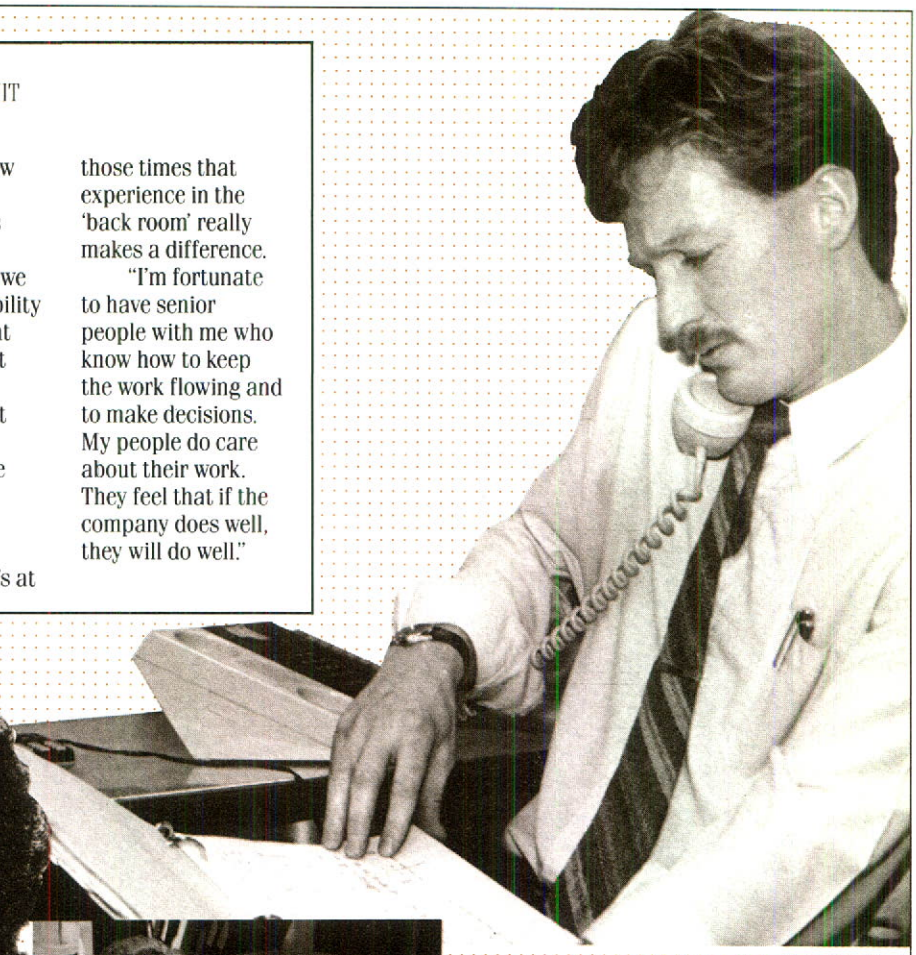
"People seem to work very hard here. They pull their own weight and really do try to do their best. At month-end, you'll see people really sweating to get the systems out on time. I think they realize that, as far as working for the company is concerned, you get out of it what you put into it."

CRAIG MALCOLM, SECTION MANAGER, MANUAL ASSEMBLY, SL-1 PRINTED CIRCUIT BOARDS, BELLEVILLE.

"I've been with the company for two-and-a-half years, and came to this job from methods engineering. I've found that the crew I work with is extremely conscientious and is constantly seeking to find a better way of doing things. You often hear questions like 'What's a better way of dressing a mod wire' or 'How can we improve efficiency in this area?'

"Of course, we have a responsibility to make sure that we have the right part in the right place at the right time. That's standard. But we often run into situations that present unique problems, and it's at those times that experience in the 'back room' really makes a difference.

"I'm fortunate to have senior people with me who know how to keep the work flowing and to make decisions. My people do care about their work. They feel that if the company does well, they will do well."



MARY HULL, LAYOUT OPERATOR, FIELD REPAIRS, BELLEVILLE.

"I've been with the company for 29 years, and worked in just about every area from transformers to satellites. I've spent the last five years in field repairs, setting up lines, seeing that the work flows through smoothly, and sorting out problems. I enjoy working here, I enjoy the people, and I enjoy the job. There's a lot of freedom in my work and I feel I have a certain amount of control as to what goes on.

"I believe that an effective employee is someone who thinks, who is concerned about quality as well as productivity. For that reason, I'm a member of the Employee Information Team. We set up meetings with managers and publish information to get across to everyone the need for quality and productivity, and to show what happens in other departments if the standards aren't met.

"Everyone in Belleville considers Northern Telecom to be a good place to work because it offers excellent pay and relatively secure jobs. And, of course, the business we're in is the way of the future."

CRYSTAL CALHOUN, SENIOR AUDITOR, KIT PREP, SANTA CLARA.

"Our department receives kits of parts and components in from the stockroom. My job is to check to make sure all the ICs (integrated circuits) are there with the right value, part numbers, and quantities.

"My job depends on quality. I believe in a quality product, because if you maintain quality at the beginning, this saves time in manufacturing and all the way down the line.

"I'm not just here to do a job. If I find there's a problem I will talk to the supervisors and do whatever else I can to make sure that it gets cleared up. If we don't work together we won't get anything done, so we have to work hard to keep good communications open. I know just about everybody in manufacturing on a first-name basis. That makes it easier for me, and easier for them, to solve problems when they come up."

Operations review for 1984

NORTHERN TELECOM INVESTS $1 BILLION IN ITS FUTURE AS REVENUES SOAR TO RECORD HIGHS

Sales of DMS switches and SL PBXs lead the way as record revenues and profits are recorded in 1984. The corporation maintains its status as the world's leading supplier of fully digital telecommunications equipment despite aggressive competition.

1984 was another spectacular year for Northern Telecom. It was marked by record revenues, profits, order input, and year-end backlog. The corporation invested more than $1 billion in the future, spending $570 million on capital equipment and $432 million on research and development.

Despite aggressive competition, Northern Telecom remained the world's largest supplier of fully digital telecommunications systems, signing major new contracts in the U.S., Asia, Europe, and the Caribbean.

THE MOST SIGNIFICANT factor in the corporation's growth in 1984 was the rapidly increasing demand for DMS switches and SL PBXs. Central office switching accounted for 43.1 percent of consolidated revenues. DMS revenues exceeded $1.6 billion, up 67.8 percent from 1983. SL Family revenues rose 37.8 percent in 1984 to $864 million.

By year-end, the order backlog exceeded $2.3 billion, up 50.9 percent from a year earlier. Consolidated revenues increased by 32.5 percent, from $3.3 billion in 1983 to a record $4.4 billion in 1984. Net earnings applicable to common shares for the year were $318 million, also a record.

In 1984, integrated business communications systems and terminals revenues rose 24.1 percent to $1.5 billion. SL PBX revenues led the increase, rising 37.8 percent to $864.1 million from $627.2 million in 1983. Other significant gains were recorded in sales of key telephone systems — particularly the Vantage line — which were up 56.7 percent; SL-10 data packet switching revenues, up 25.7 percent; and telephone apparatus, up 21.9 percent.

Transmission products contributed $600 million to consolidated revenues, up 15.4 percent over sales of $520 million in 1983.

OVER 63 PERCENT of Northern Telecom's revenues were generated by sales in the U.S., firmly establishing the Bell operating companies as the corporation's largest individual market. At year-end, Northern Telecom equipment had been sold to all of the 22 Bell operating companies. Total revenues from this market more than doubled to US$699 million from US$340 million in 1983.

About three-quarters of the sales to the BOCs in 1984 were for DMS switching systems. One of the largest contracts signed was a six-year supply agreement with the two Pacific Telesis companies, Pacific Bell and Nevada Bell, for the DMS-100 Family of digital switching systems. Purchases over the first two years of the contract were expected to reach $200 million.

NEW DMS CONTRACTS were also signed with several other Bell holding companies, including a four-year agreement with Spurs West, the procurement partnership of Mountain Bell, Pacific Northwest Bell, and Northwestern Bell. In addition, Spurs West signed a four-year agreement for transmission products and services, including Northern Telecom's voice-frequency products, fiber optics, channel banks, radio equipment, T-1 span lines, and DMS-1 urban and rural carrier systems.

Diane Richmond at work during a technical class at the Microelectronics Training Center at Rancho Bernardo, California.

The North American Market

DMS shows growing strength in both U.S. and Canada

UNITED STATES

U.S. operations revenues amounted to $2.8 billion in 1984, accounting for 63.9 percent of total worldwide revenues. This represented an increase of 50.8 percent from revenues of $1.9 billion in 1983.

Northern Telecom increased its sales to all markets in the U.S. DMS revenues were up 77 percent, transmission revenues up 58 percent, and SL PBX revenues grew 43 percent over the previous year. Sales to Bell operating companies (BOCs) more than doubled in 1984 to US$699 million.

Major DMS contracts were signed with many of the telecommunications companies and long-distance carriers in the U.S., including MCI Communications, Satellite Business Systems, STARNET, Argo Communications, and ALLNET Communication Services.

As a result of its growing strength in the United States, in January 1984 NTI established a third major operating group called Integrated Carrier Systems. The group consists of three divisions: the carrier networks unit, based in Richardson, Texas, which develops, manufactures, and markets switching and other systems for the interexchange carriers (IECs); the transmission division, based in Atlanta, Georgia, with a manufacturing plant at nearby Stone Mountain; and a marketing and sales division in Vienna, Virginia, serving the special needs of the federal government.

Planning continued at NTI for a move from three separate office buildings in Nashville's Metrocenter to a new eight-story headquarters building located a short distance away. The US$25-million facility, to be called Northern Telecom Plaza, is scheduled for completion in June, 1985. It will include a glass atrium/lobby, an executive floor with a product display area, a multimedia conference center, a cafeteria, and a fitness center.

The new headquarters building is also the site of the first installation in Tennessee of South Central Bell's fiber-optics transmission service, known as LightGate. The LightGate service will connect the new headquarters building to the national telephone network via four miles of Northern Telecom optical-fiber cable.

CANADA

Northern Telecom continued to expand its operations in Canada in 1984, spurred in part by an economic recovery that saw the inflation rate fall to its lowest level in years. A pick-up in capital spending by the telephone companies resulted in a healthy rise in DMS revenues, up 48 percent for the year, while SL-PBX revenues rose more than 19 percent. Total revenues from the Canadian market topped $1.2 billion, representing 28 percent of worldwide revenues. Sales to Bell Canada Enterprises (BCE) and its subsidiary and associated companies were up 13.1 percent to $903.9 million, representing 20.7 percent of consolidated revenues.

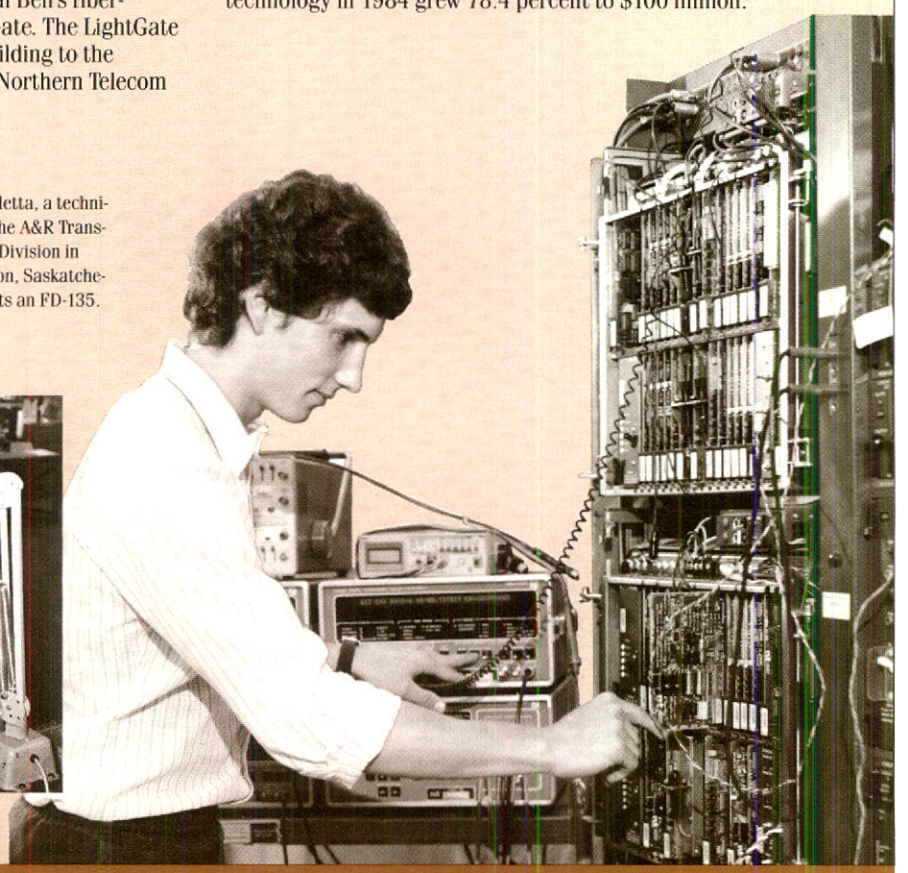
The Harmony residential telephone set provided one of NTC's most dramatic success stories in 1984. First-year sales of the new electronic phone had been expected to reach about 250,000 units. At year-end, however, sales had reached some 1.2 million sets — nearly five times the anticipated volume. Sales in Canada of Harmony and other telephone apparatus rose 35 percent.

Although the U.S. remains our largest fiber-optics market, the development of fiber-optics technology is a rapidly growing aspect of our operations in Canada. Last fall, our Optical Systems Division installed a 3,200-kilometer fiber-optics network for Saskatchewan Telecommunications. The $26-million network is one of the world's major fiber-optics projects involving a public telephone network.

An agreement was also reached with Alberta Government Telephones for the joint development of optical-fiber products and systems. The first system resulting from this agreement was the FD-135, a 135-megabit optical transmission system. In 1985, Northern Telecom will introduce the FD-565, a system capable of transmitting 565 million bits of information per second on a single fiber.

The corporation's worldwide revenues from fiber optics technology in 1984 grew 78.4 percent to $100 million.

Rafaella Pierazzo (left) and Angela Krzic complete the final soldering of circuit boards for Harmony telephone sets at London, Ontario.



Paul Gelletta, a technician at the A&R Transmission Division in Saskatoon, Saskatchewan, tests an FD-135.

A 46-month agreement with Ameritech Services, Inc. will supply DMS switches to Illinois Bell, Indiana Bell, Michigan Bell, Ohio Bell, and Wisconsin Bell. Northern Telecom also signed a multi-million-dollar, three-year agreement to supply Ameritech with transmission equipment on an as-ordered basis. The actual value of the contract cannot be determined until Ameritech's Bell companies decide how much equipment to order; however, the contract sets the terms, conditions, and price of purchases.

IN CANADA, a $4.4-million DMS-10 agreement was signed with Hydro-Québec. The seven systems covered in the contract form an important part of Hydro-Québec's program to maintain its telecommunications network at the leading edge of technology; in addition, they represent the first application of the DMS-10 to a private network.

Growth in DMS was marked by the installation in July of the 500th DMS-100 switch. The switch went into service in the small community of Wallace, North Carolina.

By year-end, the number of SL-1s produced since their introduction in 1975 exceeded the 12,000 mark, serving more than four million lines worldwide. The SL-1 is produced at our plants in Santa Clara, California, Belleville, Ontario, and Galway, Republic of Ireland.

SL SALES boomed in the U.S. and overseas. SL-1 supply contracts were won for two of China's most prestigious hotels, the Beijing Hotel in Beijing (formerly Peking), and the Garden Hotel in Guangzhou (formerly Canton). Both systems, each valued at $1 million, are equipped with a specially designed software package for hotels. Two Algerian companies, Sonatrach and Sonatite, purchased a total of $11-million worth of SL systems.

ANOTHER SIGNIFICANT DEVELOPMENT in SL Family sales was the purchase of an SL-10, valued at $1.7 million, by the Hong Kong Telephone Company. This was the first Northern Telecom data packet switch sold in Asia.

Another major SL customer was the U.S. Air Force, which has purchased SL systems for use in the military's global automatic voice network (AUTOVON). In addition, Centel Business Systems signed a US$35-million contract with Northern Telecom last year to distribute SL-1 and SL-100 systems.

The SL Family also continues to sell well in Canada. Last year an SL-1 supply contract was signed with Westinghouse Canada, valued at $1.5 million, and an agreement was signed with Saskatchewan Telecommunications for two SL-1XN systems, valued at $2.2 million. A two-year, $4-million agreement was reached with Imperial Oil, covering the sale of SL-1 and DMS systems, as well as a variety of data communications products.

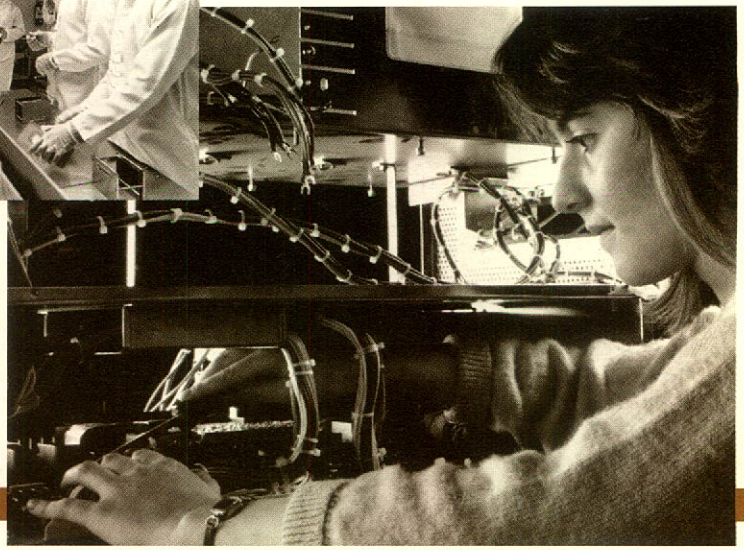
In July, Northern Telecom signed an exclusive two-year agreement with John Labatt Limited, a major Canadian company in the food and beverage industry. The $2-million contract covers the supply of 20 SL-1 PBXs and Vantage key telephone systems.

THE DEMAND for Northern Telecom products in 1984 was higher than anticipated. Accordingly, the corporation raised its planned level of capital expenditures, most of which went towards increasing production capacity and developing new processes to improve productivity.

To meet the growing demand in the United States for DMS switches, US$120 million was invested to enlarge our operations in Research Triangle Park, near Durham, North Carolina. The new facilities include a two-story office building, a 193,000-square-foot manufacturing plant and a warehouse for trucking operations.

At the transmission systems division in Atlanta, Georgia, US$42 million was invested to more than double the size of the existing plant. Most of the new capacity is devoted to manufacturing the DMS-1 Urban, a new digital transmission system that is designed to achieve a more efficient use of network facilities. Scheduled for completion this June, the expansion includes a three-story office building for administration, marketing, and engineering.

Laura Shepard, an instructor at the Microelectronics Training Center in Rancho Bernardo, California, demonstrates the proper way to handle a wafer to keep its hundreds of semiconductor chips uncontaminated.



Virginia Cattle, a trainee in the assembly area of the Hemel Hempstead plant in England, checks wiring and circuitry.

TO KEEP PACE with the increasing demand for SL systems, a further expansion of the business communications systems division at Santa Clara was begun. Half of the US$7-million addition is devoted to manufacturing facilities, while the other half contains marketing, technical, and other offices.

In Western Canada, the dramatic growth in DMS sales resulted in an $11-million expansion of the Calgary digital switching systems plant, more than doubling its size and tripling its work force. In addition, $4.3 million was invested to equip the plant with sophisticated computer-automated test equipment (CAT). The expansion and new equipment enabled the plant to increase its production capacity from one DMS system per week to four.

In Ottawa, construction began on an $80-million advanced technology facility dedicated to semiconductor design. The objective of the new Northern Telecom Electronics facility is to develop the design and manufacturing processes required to produce semiconductors, or microchips, to an accuracy of one micron or less. (A micron is about one-fiftieth of the diameter of a human hair.) These chips will deliver significantly increased capability and operating speed, and will help ensure that the corporation's products and systems remain competitive in cost and functionality. The 105,000-square-foot structure is scheduled to become operational in 1987.

AN INVESTMENT of a different sort was the acquisition of the additional human resources needed to support our growth. Worldwide, Northern Telecom increased its staff from 39,318 in 1983 to 46,993 employees at the 1984 year-end.

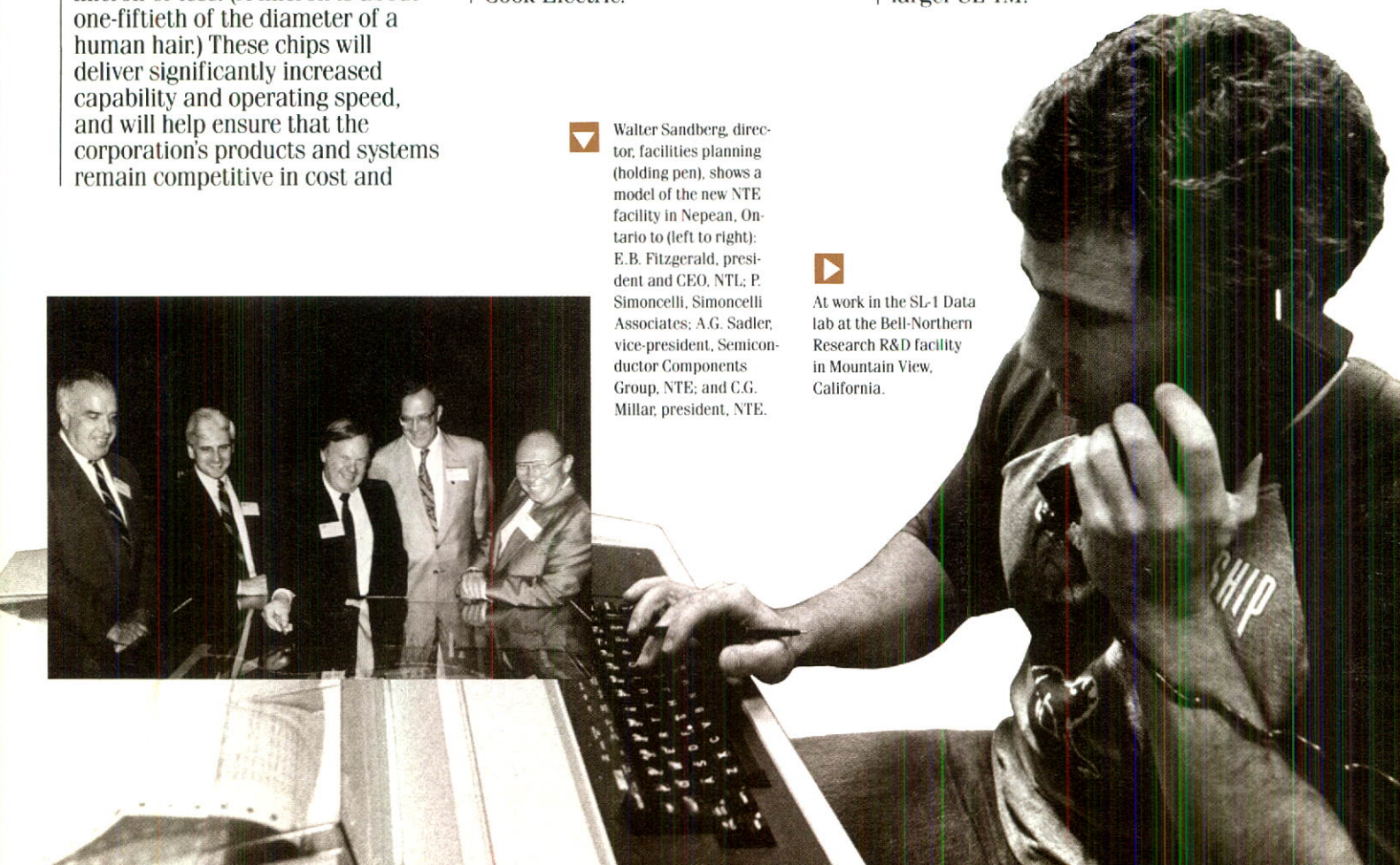
Increasingly, high-tech success depends on dramatically speeding up new-product development. In order to keep pace with the intensifying competition of the global telecommunications market, investment in research and development was increased by 33 percent last year. By year-end 1984, $432 million — or about 10 percent of total revenues — had been invested in R&D activities. The corporation expects to maintain this level of support for R&D over the next few years.

ABOUT 60 PERCENT of 1984 R&D activity was carried out in BNR labs. The rest was spread over numerous Northern Telecom manufacturing and design facilities, including NTE and Cook Electric.

With the introduction of DMS-100 Data in June, Northern Telecom became the first corporation in the world to offer high-speed data handling features on digital central office switches that are part of the public telecommunications network. DMS-100 Data allows users to transmit data over standard, twisted-pair telephone cable, eliminating the cost of installing high-speed transmission circuits.

The SL-1 product line continued to evolve in 1984 with the introduction of four new models and several new software packages. A significant step was the introduction of the SL-1S and the SL-1MS to the North American and international markets. The SL-1S, with an ability to handle 32 to 120 lines, responds to the needs of the small-business community, while the SL-1MS is designed for users requiring 80 to 400 lines for larger-scale applications. Both systems can accommodate a full range of terminals, including the Displayphone, and are more compact than previous models, providing similar power in much less space. They also offer most of the features available with the larger SL-1M.

Walter Sandberg, director, facilities planning (holding pen), shows a model of the new NTE facility in Nepean, Ontario to (left to right): E.B. Fitzgerald, president and CEO, NTL; P. Simoncelli, Simoncelli Associates; A.G. Sadler, vice-president, Semiconductor Components Group, NTE; and C.G. Millar, president, NTE.



At work in the SL-1 Data lab at the Bell-Northern Research R&D facility in Mountain View, California.

The International Market

Vienna launch a highlight of European operations

A highlight of the corporation's European operations in 1984 was the introduction in March of the Vienna Family of computer and office information systems. Designed in the United Kingdom by Northern Telecom Data Systems for the European market, Vienna combines universal communications standards with widely used operating systems and software languages. By the end of the year, orders were on hand for terminals and shared-resource computers from more than 100 customers in seven European countries.

JAPAN

Northern Telecom is the first North American-based company to sell telephone sets to Japan, signing a $2-million contract with Nippon Telegraph and Telephone (NTT) of Tokyo for 60,000 e2500 residential touch-tone sets in April. The contract came after many months of negotiations and closely followed NTT's announcement that Northern Telecom had been chosen to be its first foreign supplier of large PBX systems.

KOREA

In Korea, a technology-transfer agreement was signed with Daewoo Telecom for the manufacturing rights to Northern Telecom's optical-fiber transmission systems. Daewoo has been manufacturing SL-1 systems since 1982.

UNITED KINGDOM

Northern Telecom plc installed the U.K.'s first Loop Reporting System, an LRS-100, for British Telecom in Croydon, Surrey, in July. By November, the system was extended to 600,000 telephones and now serves as the backbone of British Telecom's six London South Area repair-service control centers. The system, which provides sophisticated customer-records administration, subscriber-line testing, and fault reporting, was custom-designed for the U.K. network using the UNIX operating system.

TURKEY

On December 18, the Republic of Turkey officially inaugurated its first digital telephone exchange — a Northern Telecom DMS-10M — at a cutover ceremony held in Ankara, the national capital. The ceremony was attended by His Excellency Veysel Atasoy, minister of communications, General Servet Bilgi, director-general of the Post, Telegraph and Telephone Administration (PTT), and NTL vice-chairman Basil A. Beneteau. General Bilgi described the event as "an important milestone in our relationship with Northern Telecom and in the economic and social development of Turkey."

BERMUDA AND THE CARIBBEAN

Closer to home, business with Bermuda and the countries of the Caribbean continued to grow.

The largest contract, won against international bidding, will extend the digital telecommunications network in Trinidad and Tobago. Installation of the initial phase of the network was begun by the corporation two years ago. Valued at more than US$120 million, the latest contract calls for 193,000 lines of DMS-100 switching, a fiber-optics digital radio transmission network, telephone sets, and outside plant equipment.

Construction also began on a 14.6-kilometer fiber-optic transmission system for the Bermuda Telephone Company, and major DMS contracts were signed with the telephone companies of Barbados and Jamaica.

FIRST LISTING

The corporation continues to place a major emphasis on the international marketplace. Northern Telecom products have now been sold in some 90 countries. A further reflection of the corporation's expanding horizons was the listing last year of Northern Telecom common shares on the London Stock Exchange, the first listing of Northern Telecom stock on an exchange outside of North America.

Vienna Family terminals display their crisp European look in Northern Telecom's manufacturing facility at Hemel Hempstead, England.

Walter F. Light, chairman, NTL, (right) observes the start of trading of Northern Telecom's common stock on the stock exchange, in London, U.K. The event marked the first listing of the corporation's shares on an exchange outside North America.

A RESPONSE to the needs of even larger customers was the introduction of the SL-1N and the SL-1XN. These new systems can handle up to 1,200 lines, and more than 5,000 lines, respectively. In addition to being more compactly designed than their predecessors, these systems have greater call-handling capability.

THE FIRST of the cellular mobile-telephone radio systems developed by Northern Telecom and General Electric went into service in June in Minneapolis. In this venture, GE provides in-car units and microwave components while Northern Telecom provides the DMS-250 cellular switching system. Calls are transferred from one "cell" to the next as the user's car moves across the city. Five systems were put into service in Minneapolis, Phoenix, Seattle, and Portland.

Plans were also announced to develop a cellular mobile radio capability for the DMS-10, available either as a stand-alone cellular system, or as a combined cellular and land-line system for small communities and rural environments. Cellular systems offer many more channels than conventional mobile telephone systems, providing ready access to tens of thousands of subscribers simultaneously.

The advances that Northern Telecom has made in developing products and systems for the office were demonstrated at the Interface '84 trade show held in Las Vegas in March. Among them was the multi-channel Computer-to-PBX Interface (CPI), jointly developed by Northern Telecom and Digital Equipment Corporation, which established the two corporations as the first computer and telecommunications companies to implement the standard interconnection. Since CPI was announced in 1983, 105 companies have signed licenses for the specifications.

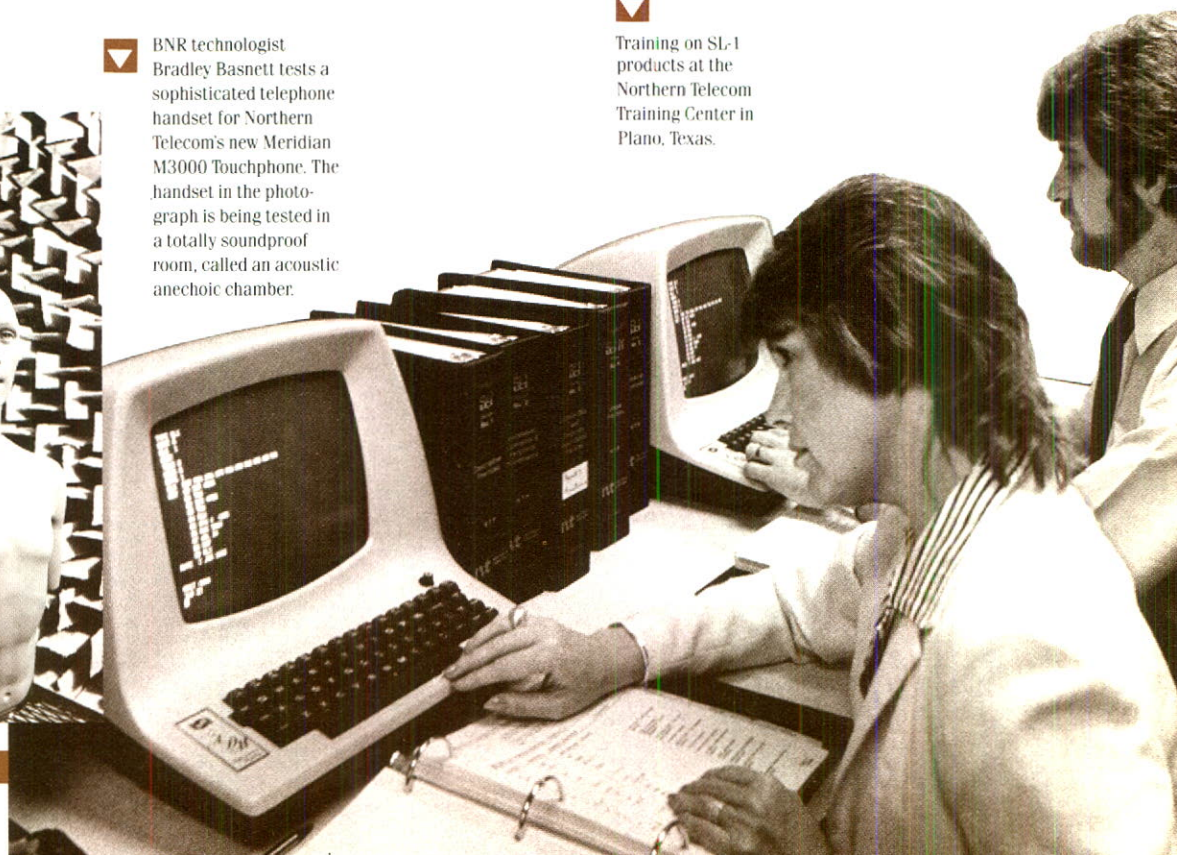
Although in recent years much of our emphasis has been on evolving integrated information-management systems, the corporation has continued to expand its basic product line — the telephone.

LAST YEAR several new models were added to the corporation's expanding family of electronic telephones. In August, Northern Telecom Canada announced Unity I and Unity II, the second and third members of the series 8000 family (Harmony was the first). The new models are designed to compete in the single-line business-telephone market, replacing the old 500, 2500, and 2500 Link series. Dramatic changes have been made in the architecture of the new models. The Unity I and Unity II contain about half the components and require only half the manufacturing time of the older models.

In the U.S., Northern Telecom Inc. announced a new public telephone that uses credit cards instead of coins, and added Quick Touch to its line of residential telephones. Quick Touch is the corporation's first residential telephone to allow callers to store numbers and access custom calling features or long-distance carriers with the push of a single button. It also features last-number redial, select-number redial, call waiting, and call holding.

SEVERAL NEW FEATURES were added to both the stand-alone and SL-1 versions of the Displayphone, including a new keyboard equipped with full-size keys comparable to those of a standard data terminal. Displayphone PLUS was also introduced, an enhanced terminal that allows increased access to

BNR technologist Bradley Basnett tests a sophisticated telephone handset for Northern Telecom's new Meridian M3000 Touchphone. The handset in the photograph is being tested in a totally soundproof room, called an acoustic anechoic chamber.



Training on SL-1 products at the Northern Telecom Training Center in Plano, Texas.

computer systems from many manufacturers. Like the original Displayphone, Displayphone PLUS can answer data calls from any compatible unit.

Bell-Northern Research also broadened its horizons in 1984, opening new labs in Atlanta, Georgia, and Maidenhead, U.K., and enlarging its facilities near Research Triangle Park in North Carolina. Employment at the RTP lab more than doubled in 1984 while BNR's total population increased from 3,530 to 4,160.

Underlying BNR's expansion is the corporate philosophy of customer-driven R&D, a strategy to bring key researchers and specialists closer to the needs of customers. At the new RTP and Atlanta labs, skilled BNR personnel work directly with telephone companies and other carriers to develop individual network solutions. The new Maidenhead facility, BNR's first lab to be opened outside of North America, is primarily engaged in the development of circuit and packet switches for international markets.

BNR has also strengthened its ties with industrial, academic, and government research groups. A significant step in this direction was the announcement last June of BNR's affiliation with the Microelectronics Center in Raleigh, North Carolina. MCNC is one of the leading cooperative institutes in North America, bringing together the interests of six universities and several companies to foster the development of advanced micro-electronics technology. The focus of BNR's activity is VLSI (very large-scale integration) research.

NORTHERN TELECOM ELECTRONICS also enlarged its U.S. operations with the expansion of its custom-manufacturing facility in Rancho Bernardo, California. The US$4.3-million project doubled the plant's size and is expected to create 200 new jobs in the San Diego area.

NTE also undertook two major expansion projects in West Palm Beach, Florida. The company is investing approximately US$13 million to increase production capacity at its Hill Avenue location from 114,000 square feet to 206,000 square feet. As a result, employment at the plant has increased to about 900 persons. In addition, NTE has outgrown its 30,000-square-foot location at 42nd Terrace North in West Palm Beach, and has leased an additional 30,000 square feet in Technology Place, a business and industrial park. The cost of alterations to the building and new equipment will total more than US$3 million.

THIS YEAR, Northern Telecom will be a part of Expo '85, a world's fair which is being held in Tsukuba, Japan. Northern Telecom was selected by the United States Information Agency to supply the communications system for the official U.S. pavilion. The theme for the U.S. exhibit is "Artificial Intelligence and the Free Flow of Information." Exhibits will emphasize advances in the field of global telecommunications, especially in the sharing of information among computers.

In addition to providing the working communications for the U.S. pavilion, Northern Telecom's SL-1 system will be used to demonstrate a variety of advanced communications services to visitors, enabling millions of Japanese citizens to see the SL-1 firsthand.

Robert Isaacs, industrial engineer, Design Interpretive group, BNR, displays design sketches, prototypes, and the final version of the new series 8000 Unity I telephone.

Irwin Brathwaite checks circuits using the Multiplex automatic testing system.

The Money Circle

NORTHERN TELECOM EARNED MORE AND SPENT MORE IN 1984 AS REVENUES REACHED NEW HIGHS

Revenues grew 32.5 percent, earnings rose a record 18.3 percent, and employee compensation went up 29 percent to $1.8 billion. Growing sales, expanding marketing and R&D, and increased production raised worldwide employment to 46,993.

1984 was another record year for Northern Telecom. Consolidated revenues reached $4.379 billion, 32.5 percent higher than the $3.304 billion recorded in 1983.

U.S. revenues totalled $2.799 billion, representing about 63.9 percent of consolidated revenues for 1984. This was an increase of 50.8 percent from the $1.856 billion, or about 56.2 percent of total revenues earned in 1983. Increased sales of fully digital central office switching, SL PBXs, and transmission systems accounted for much of the gain.

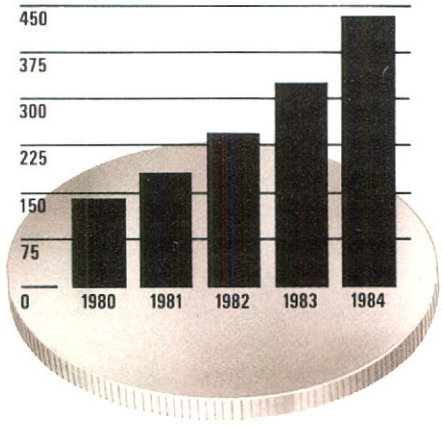
SALES TO BOCs

Sales to the Bell operating companies, which were divested by American Telephone and Telegraph last year, reached US$699.3 million, or more than double the 1983 level of US$340 million, and more than quadruple 1982's sales of US$161 million.

While a 77.3-percent increase in DMS switching revenues led this U.S. surge, revenues from transmission — which includes sales of fiber optics and digital radio — were up 57.6 percent. Revenues from SL PBXs exceeded 1983 levels by more than 43.2 percent.

Northern Telecom's international business started slowly in 1984, but gained momentum towards the latter half of the year. Revenues were $372.5 million (8.5 percent of the total), compared with the 1983 level of $376.3 million (11.4 percent of the total) and $325.2 million (10.7 percent of the total) in 1982. By the end of the year, however, the international order backlog had climbed to $191 million, more than 61.1 percent higher than the $118.6 million of the previous year.

R&D Investment ($ millions)



Increased capital spending by telephone companies in Canada contributed to a 12.7-percent growth in 1984 Canadian revenues, which reached a total of $1.208 billion, up from $1.072 billion in 1983.

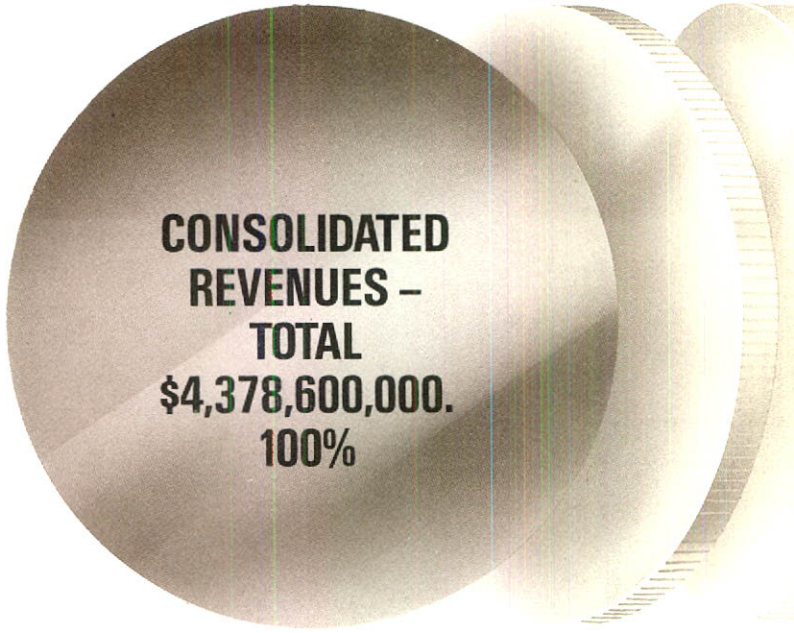
NEW MARKETS

An expansion into new markets, such as office information systems and interconnect sales by distributors, and the success of leading product lines — DMS, up 47.7 percent; SL PBXs, up 19.3 percent; and telephone apparatus, such as the new electronic Harmony telephone sets, up 34.9 percent — also contributed to revenue growth in Canada.

The profitability of the DMS Family and the increasing proportion of consolidated revenues attributable to it contributed to further improvement in the corporation's gross profit margin in 1984. The gross margin in 1984 was 38.5 percent, compared with 36.1 percent in 1983, and 30 percent in 1982.

The consolidated gross-margin improvements also reflected the continuing success of the corporation's cost-reduction and productivity programs.

Earnings in 1984 (the difference between revenues and expenses, after taxes), after payment of preferred share dividends, rose



18.3 percent to $317.5 million. In 1983, the comparable figure was $268.4 million, and did not include dividends on the preferred shares, which were only issued in 1984. 1982 net earnings were $139.4 million.

Expenditures for employee compensation, taxes, capital investment, and R&D also reached record heights in 1984.

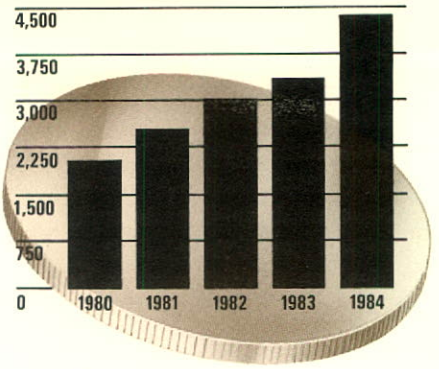
Growing sales in the United States, expanding marketing and R&D programs, and increased production in Northern Telecom's plants in Canada, the United States, and Malaysia led the corporation to hire 7,675 new employees in 1984, raising the total number of employees to a new high of 46,993, as compared to 39,318 at the end of 1983.

EMPLOYEE COMPENSATION

Total compensation — salaries, wages, and benefits — for all employees was $1.77 billion in 1984, an increase of 28.7 percent over 1983. Average employee benefits were equal to 14.9 percent of total compensation. Total employee compensation represented 40.4 cents of every dollar of revenue.

After salaries, wages, and benefits, the next largest expenditure was the record $1.754 billion spent on materials, goods, and services

Consolidated revenues ($ millions)



necessary to manufacture products to keep the business running. This expenditure represented 40.1 cents out of every revenue dollar.

Included in this figure are capital expenditures of $569.6 million, a 51.1-percent increase over last year's level of $376.9 million. A significant part of that investment was related to DMS. Most of the total capital investment was devoted to production and process equipment for DMS and SL switching, transmission systems, integrated circuits manufacturing, and in research and development equipment and facilities. In addition, there was significant investment in computers, and in computerized manufacturing, test, and design systems to increase productivity and quality.

RETAINED EARNINGS

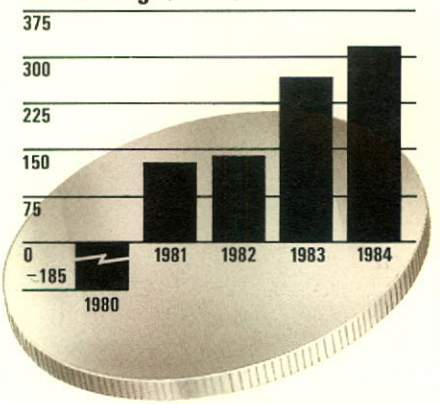
All of Northern Telecom's physical plant and facilities experience wear and obsolescence, which diminish their worth. Over the last year, this lost book value, or depreciation, amounted to $233.2 million.

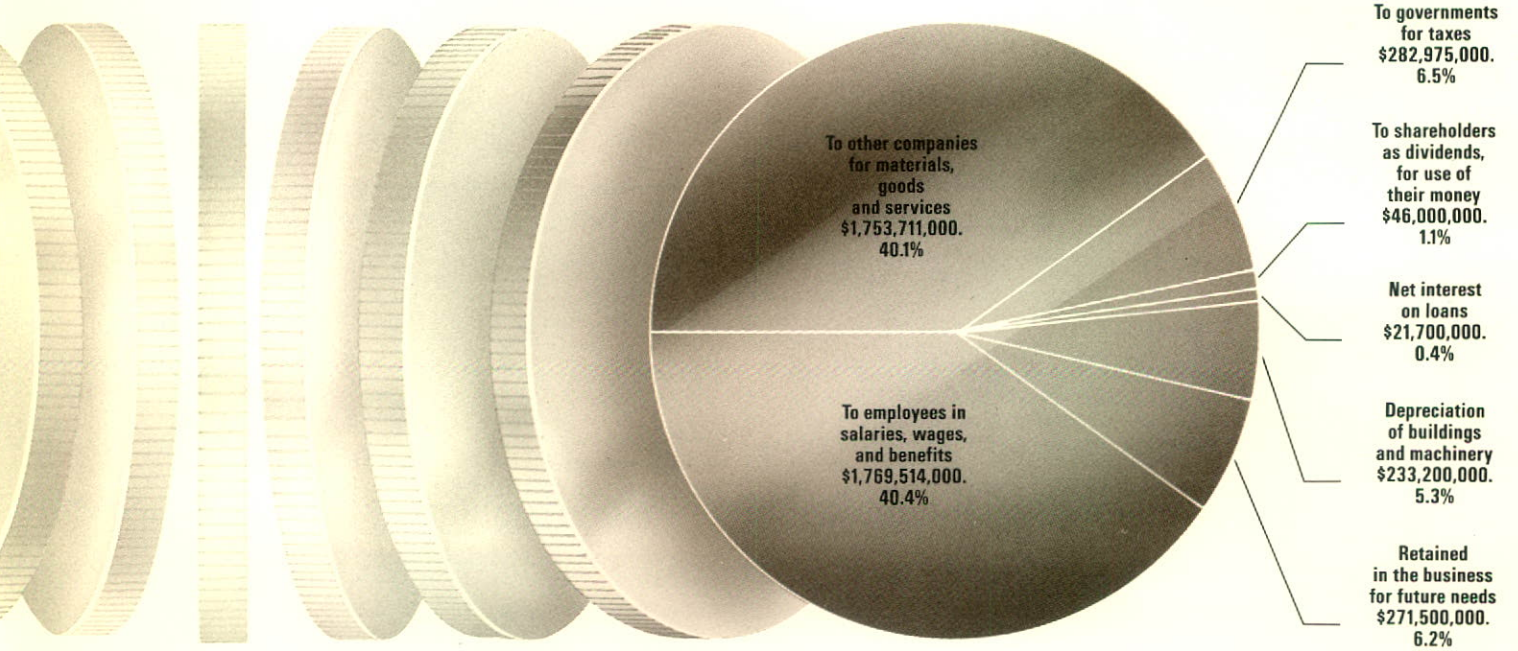
Corporate taxes paid to federal, provincial, state, and local governments totalled $283 million, an increase of $95.5 million over 1983's $187.5 million.

Owners of Northern Telecom's 115.6 million outstanding common shares received about $46 million in dividends, or about 1.1 cents of each dollar of revenues.

The remaining $271.5 million of earnings – $47.8 million more than last year — was retained by the corporation to help finance its future development. This represents about 6.2 cents out of every dollar of revenues.

Net earnings ($ millions)




To other companies for materials, goods and services $1,753,711,000. 40.1%
To employees in salaries, wages, and benefits $1,769,514,000. 40.4%
To governments for taxes $282,975,000. 6.5%
To shareholders as dividends, for use of their money $46,000,000. 1.1%
Net interest on loans $21,700,000. 0.4%
Depreciation of buildings and machinery $233,200,000. 5.3%
Retained in the business for future needs $271,500,000. 6.2%

UNITED WAY: LOCAL INITIATIVES LEAD TO SPECTACULAR GAINS IN 1984

A superlative effort throughout North America takes the employee campaign to record levels. Our objective of 90-percent participation is in sight.

Northern Telecom's 1984 employee United Way campaign surged to record levels with total employee donations of $1,610,470 (in mixed U.S./Canadian dollars), a *56.3-percent increase* over the previous year. In Canada, 13,383 of the 22,931 employees eligible to contribute gave $842,438 to the United Way, resulting in a 65.5-percent increase in total donations. In the United States, 9,919 of the 14,642 eligible Northern Telecom employees contributed a total of $768,032, a gain of 47.4 percent over their 1983 effort.

These spectacular results came from scores of local initiatives taken at Northern Telecom facilities throughout North America. In West Palm Beach, Wilbur Willingham Weepul, a four-foot-high handmade mascot, displayed campaign results on his dangling feet as he perched above a plant entrance; in Belleville, individual departments such as human resources and control battled each other to win the plant's United Way trophy; in London, Ontario, many employees contributed a portion of their overtime pay to the campaign under their own "Share A Day with the United Way" program.

As a result of this superlative team effort throughout the corporation and its subsidiaries, the number of employees participating in the 1984 campaign jumped almost 40 percent, from 17,100 in 1983 to 23,757 in 1984. Contributions were received from over 63 percent of employees at locations in North America that have United Way campaigns.

LEADING CORPORATIONS

"We have come a long way in achieving our long-term objective of 90-percent participation by eligible employees," said Edmund Fitzgerald, president and chief executive officer of Northern Telecom Limited. "With our present momentum, we will soon rank among the leading corporations in North America that support the United Way."

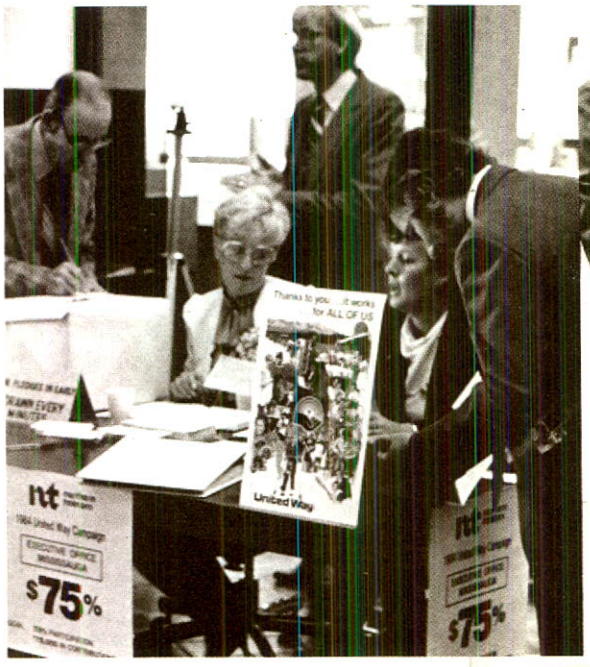
The *President's Trophy*, awarded to the location with 50 employees or more showing the most improved performance, went to BNR Richardson. Employees there lived up to the well-known Texan custom of thinking big by increasing their donations by *353 percent*.

KEY TO SUCCESS

Organization and commitment were the key to this success, said Yvon Hurtubise, BNR Richardson's campaign chairman. "We kept data from the previous year, and, by seeing who had made generous contributions, we were able to choose canvassers who were committed to the United Way idea," he explained.

Two or three canvassers were assigned to each management group of about 30 employees, Hurtubise added. "To add a spirit of competition to the campaign, we used thermometers to compare the percentage participation rate of each of the management groups."

The result was a $14,952 contribution and a doubling of BNR Richardson's participation rate to 66 from 30 percent.



NTL Mississauga campaign workers hold an early-morning Kaffeeklatsch to encourage employee contributions. Signing pledge cards are Don Byrne (left) and Owen Finn. Helen Douglas (seated, right) and Jeanette Cairns accept pledge cards as Ken Johnston looks on.

Employees at BNR Toronto nailed down second place in this category by nearly tripling their total donations. They also received the Gold Award from the United Way of Metropolitan Toronto for their outstanding support of the 1984 campaign. Their contributions increased *275 percent* from $3,405 to $9,304. In addition, the number of employees contributing more than doubled from 40 percent in 1983 to 83 percent in 1984.

SPECIAL EVENTS

Among the special events which triggered this enthusiastic response was a lunch-time seminar with speakers from the United Way and the Canadian National Institute of the Blind. "We have a very young group of employees here and few have had to use the services of United Way agencies," said Donna Fletcher, BNR Toronto's campaign coordinator. "The seminar gave them a much better understanding of where their money would be going."

Other special events included tarot card readings, and plant, book, and bake sales. "These events got the staff more involved in the campaign," said Fletcher. "We had something going on all the time."

HIGHEST PARTICIPATION

The Northern Telecom plant in Amherst, Nova Scotia clinched the *North American Trophy* for highest employee participation level with an astonishing rate of 99.4 percent. Of the 161 employees at the plant, 160 contributed to the campaign. Last year, the employees at the Amherst plant won the President's Trophy, despite working in a region of Canada which was one of the worst-hit by the economic recession.

The employees at the Northern Telecom Electronics plant at West Palm Beach finished second in this category. The Floridians achieved an equally amazing 95-percent participation level, with 752 of the 792 eligible employees donating.

Locations with 5 to 49 employees can qualify for the *President's Incentive Prize Program* by increasing both their total contributions and their number of donors by 10 percent. The three winning locations in this category were plants in Regina, Saskatchewan, Charlottetown, Prince Edward Island, and the public affairs office in Ottawa. An employee from each of these locations became eligible to choose $200 in prizes from the company gift catalog.

Yvon Hurtubise, BNR Richardson's campaign chairman, records the outstanding results which led to the winning of the *President's Trophy* for the 1984 United Way Campaign.

FOUR CRITERIA

To ensure fairness in the awarding of prizes, Northern Telecom carefully analyzes the campaign results from each location according to four criteria: total dollars donated, percent participation, average gift per employee, and average gift per donor. Point-scores are allocated, and winners are determined by calculating each location's point-score as a percentage of total points possible in a given category. "United Way officials have told us that Northern Telecom's method of analysis is one of the fairest and most sophisticated they have seen," says Theresa Arts, director, corporate contributions.

The Ottawa public affairs office merits extra congratulations for achieving a 100-percent participation rate and for ranking Number One in the U.S. and Canada for average donations per donor. Its staffers made an average contribution of $340 each to the United Way campaign. "We have a small, friendly office," said Diane Bourgeois. "It was easy to get people to contribute when you talked to them personally and pointed out that they could donate through the company's deduction plan." (1985 canvassers, please note!)

PLANTS ONE-TWO

The corporation's two main North American central office switching plants came in one-two in total donations. The Bramalea, Ontario plant came first with total donations of $181,913, followed closely by NTI Raleigh, whose employees donated $174,310. BNR Ottawa came in third with a total donation of $127,047.

"I believe we all have a right to take great pride in our achievements during the 1984 campaign," Fitzgerald said. "But doing well in 1984 doesn't mean that we can't do even better in 1985.

AMBITIOUS OBJECTIVE

He suggested that the objective for the 1985 campaign should be a 75-percent participation rate among eligible employees, and an average gift of $75 per donor. "This would mean an employee contribution of $2.3 million (in mixed U.S./Canadian dollars) to the United Way campaigns in the United States and Canada," he said. "That is admittedly an ambitious objective," he added, "but we have surpassed all of our United Way objectives in the past and I'm sure we will again in 1985."

Donna Fletcher, Bell-Northern Research, Toronto, proudly displays the Gold Award of the United Way of Metropolitan Toronto. BNR Toronto received this award for its outstanding support of the 1984 campaign.

The United Way Campaign team at Amherst, Nova Scotia that helped to bring home the *North American Trophy*. They are: (left to right) Jack Ogilvie, Pat Robinson, Gerry Cormier, Peter Sarbutt, Roy Emery, and Carolyn Seaman.

The *North American Trophy*, won in 1984 by the Northern Telecom plant in Amherst, Nova Scotia. Of the 161 employees at the plant, 160 contributed to the campaign, resulting in a participation rate of 99.4 percent.

The United Way: A proud history of community service

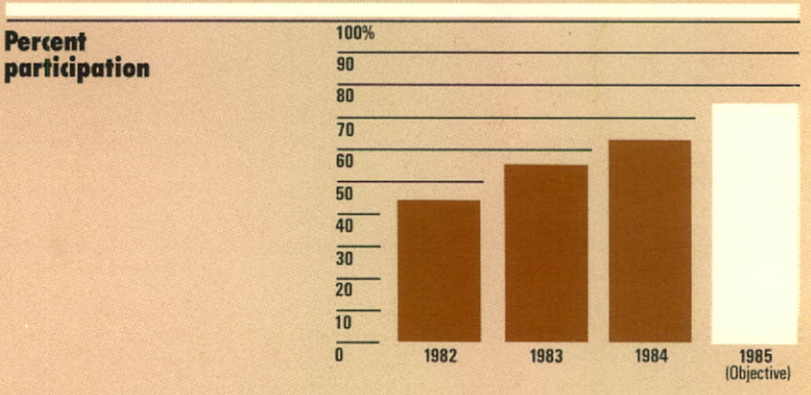
Founded in Denver, Colorado in 1887, the United Way has a long and proud history of community service in North America. Each United Way campaign is operated autonomously, at the community level, to ensure that local service organizations receive the funding they need.

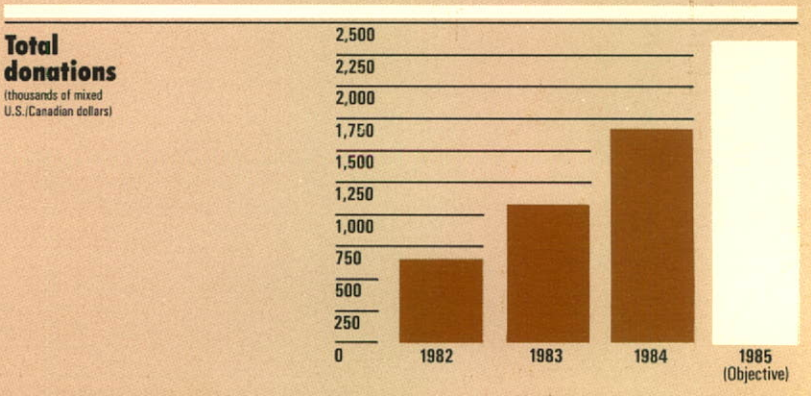
In 1984, these campaigns raised $130 million in Canada to fund approximately 2,300 community service agencies, including the Red Cross, Boy Scouts, rape crisis centers, meals-on-wheels programs for senior citizens, and family counselling organizations. In the United States during the same period, 2,200 local United Way campaigns raised $2.1 billion for over 37,000 community service agencies.

The level of United Way funding provided to an organization varies according to the quality and type of service provided, and the amount required after revenue from other sources, such as government and private donors, has been considered. Decisions regarding funding are made by a local board of directors representing the community at large.

In recent years, United Way campaigns have begun in Australia, Belgium, Hong Kong, Japan, New Zealand, the Philippines, Singapore, South Africa, Taiwan, Thailand and the United Kingdom.

UNITED WAY EMPLOYEE CAMPAIGN





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